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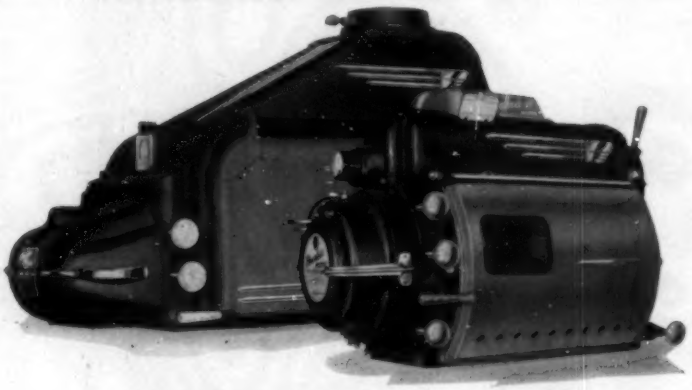

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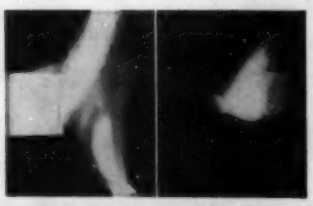

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MONTHLY CHAT

MENTIONED previously in these pages—and often with more than a bit of rancor—is the sudden conversion of executive personnel in the motion picture industry to the doctrine of technical competence. We, who have often wondered whether these people knew of the existence of a projection room, a camera, a photo-electric cell, a generator, or a sprocket, are now being beguiled by the spectacle of Mr. Mighty Industry facing an audience and begging for attention to those details which have always determined the success or failure of the industry's effort—the image on the motion picture theatre screen.

Recently, the patriarch of the industry, Mr. Adolph Zukor, faced an audience of some 4000 in Radio City Music Hall in New York. Did this venerable gentleman talk about the sale, the price, or the dating of motion pictures? Not at all. He delivered himself of a sane, simple plea that the various processes now being utilized by the industry be given the impetus of good equipment handled competently.

Mr. Zukor himself would have no objection, we feel certain, to the appended reconstruction of his remarks:

"Today everything that we in this business hope to achieve depends upon our technological resources. We at Paramount feel that all our efforts are dependent upon the finest equipment expertly used. All that we pour into a narrow ribbon of film goes for naught if we do not reproduce it properly on the theatre screen. For my part, I am glad to stand here and beg—beg, mind you—that every theatre in the world avail itself of the finest equipment that money can buy. Such equipment, in the hands of competent craftsmen, will go far toward solving our most pressing problems."

Thus spoke Mr. Zukor. But even as he spoke there were among his audience a group of people who, seizing upon such trifles as acetate film, electric motors, push-button curtain drapes and the like, were actively engaged in a concerted action to break down that standard which contributes the vital element to the successful presentation of a motion picture—the sure, deft touch of the experienced craftsman.

Sure, give us magnetic soundtracks; sure, give us multiple loudspeakers; sure, give us 3-D; sure, give us ample arclight ranging up to 200 amperes—but, God *NO*, don't give us the experience, the patience and the trust in a competent day's work which must inevitably accompany such appurtenances.

Grant us, God, an overflowing box-office, Miami in mid-winter, the country club in the summertime and all the other manifestations of Heavenly munificence. But also, God, deliver us from the scourge of paying in the form of wages for these blessings.

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VOLUME XXIX MAY 1954 NUMBER 5

The Anatomy of CinemaScope

By ROBERT A. MITCHELL

Twentieth Century-Fox seems to think that the paying patron at movie box-offices is interested not in entertainment value but in optical weight-lifting feats which encompass gigantic screens. Quality of visual image and acceptable accompanying sound have been sacrificed to the Great Jehovah—SIZE.

SEEMINGLY, the theory of relativity has been visually confirmed by CinemaScope. Space is curved—see it for yourself. A flat floor in a CinemaScope picture looks like the interior of a bathtub. Walls vault in graceful arches. Rivers flow uphill, and skyscrapers emulate the leaning tower of Pisa.

As we gazed at these Einsteinian marvels in "The Robe" and in such less pretentious C'Scopers as "How to Marry a Millionaire," we wondered if the curved screen might not become the nemesis of the 20th Century-Fox anamorphic process. Will the theatre-going public, long accustomed to perfect pictorial delineation in the movies, tolerate CinemaScope's manifold distortions after its novelty-value has subsided? The writer thinks not. Even 3-D, far more realistic visually than CinemaScope, has failed to oust the time-tried conventional type of screen presentation. And CinemaScope has no depth—only weird distortions.

CinemaScope and Curved Screens

Because the anamorphic optics of CinemaScope function with fair success, and with promise of becoming better, flat-screen projection of CinemaScope would undoubtedly have been far less irritating than the curved, roller-towel version employed to date.

Curved screens wreck proportion and perspective. Only the special 3-projector system used by Cinerama can get away with curved-screen monkeyshines. In Cinerama the curved screen is intended to "surround" the audience with the picture. This Cinerama does, and very effectively. Not so with C'Scope's much shallower curved screen.

While it is theoretically possible to get a Cinerama-like picture with only one projector of special optical design, it is obvious to the technically informed that C'Scope fails to give the desired "surrounded" feeling. That may be a good thing in view of the fact that most moviegoers, after having seen a novelty process two or three times, attend movies for relaxation, *not distraction.*

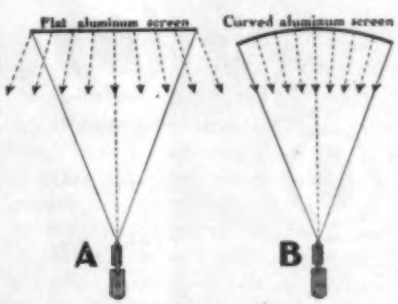


FIG. 1. Reflection of light from (A) flat and (B) curved aluminum CinemaScope screens. A flat white screen would give even distribution of light, but would require twice as much projection light. An additional metallized screen would be needed for 3-D.

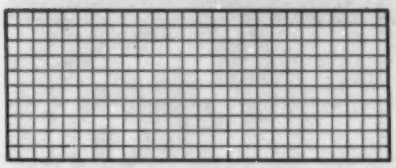
Cinerama is good in its own field, but it is hardly a dramatic medium. CinemaScope, on the other hand, being midway between Cinerama and conventional movies, is in the writer's book, neither fish nor fowl.

Limit of Screen Curvature

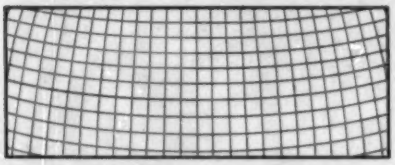
There is a definite limit to the amount of curvature permissible with the CinemaScope screen. In practice, the radius of screen-curvature is the distance from the projector-aperture to the middle of the screen. In other words, screen-curvature radius is the same as the "throw." In theatres having short projection distances, the CinemaScope screen will have greater curvature than in theatres having longer throws.

The curvature of the CinemaScope screen apparently has only one useful function, namely, better distribution of picture-illumination from its aluminized surface. An aluminum screen has "specular" properties similar to those of an ordinary mirror. If such a

screen were perfectly flat, light projected upon the side areas would bounce off to the walls of the auditorium and be wasted audience-wise. By curving the screen so that the radius of the curve is equal to the projection throw, the side areas reflect the light they receive to the seating-area (Fig. 1).



CinemaScope-delineation at a projection-angle of 0 degrees



Curved-screen distortion of CinemaScope projected at an angle of 20 degrees

FIG. 2. Distortion of CinemaScope pictures caused by the combination of screen-curvature and downward tilt of the projectors. The amount of distortion shown here has not been exaggerated.

Curved Screen Distortion

If a CinemaScope picture be projected "on the level" (that is, with a zero-degree projection angle) no distortion due to the curvature of the screen will be apparent to patrons seated near the center-line of the auditorium. Patrons in side seats, however, will notice a perspective-foreshortening which is greater at the nearer side of the curved screen. The effect is such that an actor "gains weight" as he walks from the nearer to the farther side of the screen.

Matters are complicated (for the worse, unfortunately,) when the projectors tilt at an angle. In normal projection a steep projection angle produces two interrelated effects: a "keystone" shape of the picture-frame and an elongation of the images which makes actors appear abnormally tall and thin.

The keystone-effect is mitigated by obtaining apertures of undersize width and filing them to a trapezoidal shape. Elongation cannot be remedied, although in narrow theaters the screen may be tilted back slightly to minimize it. Moderate projection angles do not appreciably affect the quality of standard flat-screen pictures.

With CinemaScope we encounter difficulties of a more serious nature even when the projection angle is comparatively small—difficulties due partly to the enormous width, but mostly to the curvature of the screen. What really happens to CinemaScope images projected at an angle is geometrically a rather complicated problem, but the effects are apparent even to the most casual observer. The picture undergoes a gross distortion, the topic of frequent unfavorable comment by patrons. CinemaScope often tempts us to laugh even when the picture is unfunny.

Bizarre Image Elongation

A downward tilt of the projectors in CinemaScope converts horizontal lines into curves that bend upward at the ends. The ocean looks like a maelstrom, and speeding trains maneuver strange humps and hollows. At the same time, all vertical lines become arched at the sides of the screen (Fig. 2). Skyscrapers bend and lean perilously.

So grotesque is the effect that any "grandeur" which the CinemaScope picture might otherwise have is nullified. Only natural landscapes composed of irregular lines and masses successfully mask the distortion and give pleasingly realistic reproduction.

These disturbing distortions make their appearance when a motion picture of *any* aspect-ratio is projected on a curved screen, thus are not peculiar to CinemaScope. The anamorphic-lens process has nothing to do with these effects, of course; but a wide-screen picture will suffer more than a picture of normal proportions on a curved screen simply because wider angles are involved.

Projection Room vs. Audience Viewing Angle

Projectionists should remember always that curved-screen distortions, even when acute, cannot be seen from the projection room. Neither, for that matter, can the lengthening, or elongation, of normal pictures projected at steep angles. The line of sight of an observer in the projection room so nearly coincides with the optical axis of the projection setup that distortions due to projection angle and screen curvature are practically eliminated for him—*but for him alone.* Patrons in the auditorium look at the screen from very different angles, and accordingly see these distortions.

Because the projection crew ought to know what kind of picture the audience sees, every projectionist, whether he shows CinemaScope or not, should study the screen images from different points in the auditorium, especially from the "orchestra."

Why curve the CinemaScope screen at all? We have seen that fadeaway of light at the sides of the picture precludes the use of flat *aluminum* screens. If CinemaScope is to be projected on a flat wide screen (which would eliminate the intolerable geometric distortions peculiar to curved screens) we must use a matte white screen. Matte screens undeniably give clearer, more evenly lighted pictures than do aluminum screens, but since they are "diffusive," rather than "specular," they require almost *twice* as much projection light for the same apparent picture-brightness.

The exhibitor saves money on carbons and electricity when he uses an aluminum CinemaScope screen, and he is also spared the expense of installing a special metallized screen for polarized-light 3-D showings. Also, 20th Century-Fox approved only two makes of screen for its CinemaScope films, Miracle Mirror and Astrolite, both of which are metallic.

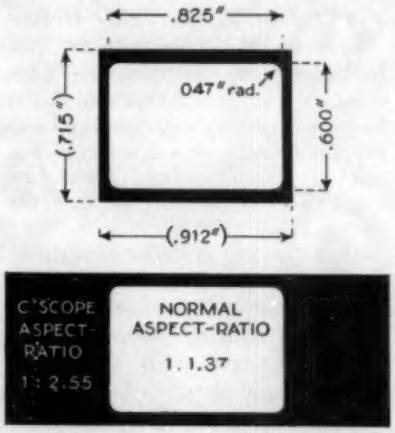


FIG. 3. Relative sizes of standard (white) and CinemaScope (black) apertures and screen images. The CinemaScope screen image is expanded to twice normal proportions by the anamorphic lens-attachment. Lenses of slightly shorter focal length should be used to produce a standard picture with the same height as the CinemaScope picture.

CinemaScope would undoubtedly appear to much better advantage on a flat white screen; and while the exhibitor has heretofore not been al-

(Continued on page 32)

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By CHAUNCEY L. GREENE

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WITH 3-D dead — if not decently interred — a post-mortem is presumed to be in order. Much has been written — and most of it would seem to be true — about the low order of story material assigned to 3-D production, but in IP we should properly concern ourselves with the projection aspects of the 3-D post-mortem.

The true situation was unconsciously evaluated more correctly by a service company engineer many years ago. Speaking of the nuisance of "shimming" projector mechanisms when mounting them on ERPI soundheads he said, "The whole trouble was that we were trying to fit our precision mechanism to one which was not a precision mechanism."

Calling a projector head a non-precision mechanism is a slight error, to say the least, but if the engineer had taken in considerably more territory he would have been far more correct and pin-pointed the underlying situation. *They* were trying to fit a precision industry (telephone) to one (theatres) which never had been, was ignorant and therefore fearful of, precision and fanatically determined never to be a precision industry.

Exhibitor Stubbornness

Through the years the exhibitor stubbornly clung to this policy. The cornicopia of science and invention poured lavishly into his lap. High intensity and high fidelity came forth from the golden horn by the early thirties, followed by push-pull reproduction, extensive use of color, Ben Schlanger's screen, stereophonic sound (Fantasia) and 3-D. All these were offered him long before the war but he wanted none of them. In the few instances when he did grudgingly accept one, he did his best to emasculate it.

A good example was exhibitor rejection of Fantasia's special sound equipment and the hanging of a few echo squawk-boxes around the walls, which jerry-rigged assembly was sold to the public as *Fantasound*. The public came, heard, and was not impressed. Most of them never guessed that they never heard the *real thing*. If that was the brave new world of the cinema they didn't think much of it's future.

Economic Suicide

The exhibitor had taken the first step to prepare his audience for television, but he never knew it. He smiled smugly. He was, he told himself, one smart cookie; *this* was showmanship. Also, he was resisting subversive influences threatening to undermine the fine old traditions of show business. Actually he was building up the technological vacuum into which television was drawn. Television did NOT invade the theatre industry; it was sucked into the technological vacuum the exhibitor created and fostered.

The man (was it Sam Goldwyn?) who said that a man could make more money with less brains in motion pictures than anywhere else spoke truly. Can anyone imagine an auto dealer prospering while offering 1932 cars in 1950? How long would any Cadillac dealer remain in business if he replaced the Cadillac motor with a "Jeep" engine and filled the gearboxes with sand before delivering the cars to the buyers?

Then, when the effects of television began to be felt, did the exhibitor seek to exploit any of the manifold things which the screen could do which television could not possibly imitate? Scarcely. Instead he "cut out all frills", reduced lighting, curtailed cleaning and in countless ways advertised to his public that his was a retrogrescent and dying industry.

The Discerning Eye and Ear

The public was quick to quit the sinking ship. If television had been fostered by that calibre of mentality, its tremendous technological problems would never have been solved. Tv would never have been a threat to anything but insomnia.

Suddenly a little clique tossed the exhibitor unceremoniously into the stream of normal competitive business activity and he went bouncing down the river bawling for help. Three great ogres rose to confront him.

1. He was going to have to spend money.
2. He was going to have to yield to the demands of precision instead of playing both ends against the middle and (worst of all),
3. He was face-to-face with increased wages and manpower.

This last was sheer communism and he would have none of it. Rags were royal raiment if worn for virtue's sake.

Now to the rescue of the exhibitor's virtue came a prominent motion picture personality, who couldn't have made a creditable presentation of a "flat" and silent motion picture, to proclaim: "It's only runnin' pitchers". The exhib rallied to this Messiah. Come whatever else, he would resist

(Continued on page 32)

Ideal Kinema, London

•

"Of course I'm annoyed. Just when I get a couple of promising trainees you have to crack that old one about cleaning out the perforations in the screen with a pin."

VistaVision: Promise of Sanity

PARAMOUNT Pictures pranced into New York City during April's closing days and before 4000-odd critical industry personnel in the giant Radio City Music Hall proceeded to demonstrate *via* its VistaVision process that a large measure of executive and technical sanity survives within the higher eschelons of major-company producing and distributing personnel.

For VistaVision, in addition to its captivating visual impact—sensible proportions, depth of focus, edge-to-edge flatness of field, and ultra-fine color—also gave rich promise of being the keystone for industry-wide technical standardization.

Simplicity, Compatability

Details of the VistaVision system, in conception and execution, in both production and exhibition, have been published in these pages, but the Music Hall show, the first public demonstration of the system, lent confirmation of the worth of the process.

Simplicity and compatability are the keywords for VistaVision, with a new development in photography providing a maximum of entertainment value at a minimum of expense. The fact that theatres the world over may utilize its advantages on *standard* projection equipment makes it doubly attractive.

The New York demonstration gave rise to several important technical questions, concerned mostly with projection procedure, which bear directly on the existing widespread confusion as to the proper utilization of the process.

Important Technical Questions

The VistaVision demonstration definitely established once and for all the, to us, inherent error of a motion picture screen image that gave merely width but not height. Before we consider the questions and answers stemming from this VistaVision showing, we should like to set forth here a brief resume of the process, as detailed by Loren Ryder, engineering director of Paramount Studios, Hollywood:

Paramount's consistent belief that wide-screen presentation is enhanced by adding height, and the need for greater screen clarity, prompted the development of this system. The first step was a method of procuring better original photographic detail. This was accomplished by exposing the area of two frames horizontally on regular 35-mm film, the camera being turned on its side.

Larger Camera Negative

Using a wider-angle lens and pulling 8 sprocket holes before the lens instead of the conventional 4, a new, large negative measuring 1.472 by 0.997 inches was produced (Fig. 1). With almost three times the area of a standard 35-mm frame exposed, much more detail was photographed than was possible on a standard frame. Furthermore, scenes can be photographed for best composition in aspect ratios of 1.66-to-1 or 1.85-to-1.

The next step was to get an optical reduction on regular 35-mm film so that it could be shown in any existing theatre without changes in projection equipment. For this a new technique was developed whereby in the printing process the large negative was turned 90 degrees and printed the same as any previous release film (Fig. 2).

The net result of such a process meant that the original depth of focus was retained in the reduction and the grain effect was practically eliminated. When projected, the full beauty of the entire scene is reproduced.

Aspect Ration All-Important

IP restates its firm conviction that motion pictures shot on a flat plane should be shown in the same manner. IP recognizes that the flat matte screen used for the VistaVision demonstration (68 feet wide by 37 feet high) poses a terrific problem of acceptable illumination. This Music Hall showing pulled 220 amperes—with benefit of filters, blowers, and sundry assorted cooling aids. Where in the name of reason may such conditions be duplicated? The answer is simple: nowhere.

The confusion created by the VistaVision showings stems from one point —the mistaken notion that such release prints may be shown in all aspect ratios from 1.33-to-1, to 2.55-to-1. But even Paramount, flushed with its VistaVision success, not only admits but *insists* that the most desirable ratio is 1.85-to-1.

Now, what does this mean to we projection people? It means that once

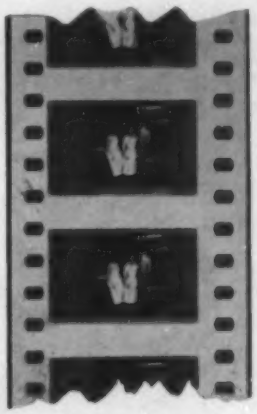


FIGURE 2.

Full-size reproduction of the 35-mm release print made from the double-frame VistaVision negative. Latter is turned 90 degrees and printed down to area shown. Resultant print gives greater resolution.

the screen proportions permissible by the physical characteristics of a given theatre are established, we people go out and get ourselves a wide-angle, short-focal, lens to properly fill the desired screen area. It's as simple as that.

Part of the confusion over VistaVision probably results from the announcement that the Tushinsky lens, a variable anamorphic lens attachment, could be used with a special anamorphic VistaVision print that would be supplied to exhibitors upon request.

"Ratio In Which It Is Short"

This announcement gave rise to the idea, particularly among exhibitors, that a marvelous lens had been discovered that was capable of projecting

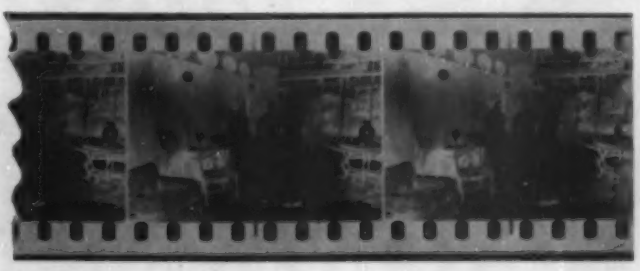


FIGURE 1.

Full-size reproduction of the VistaVision camera negative showing size and placement of the image. Note clarity of detail.

a "rubber" picture. Some thought that the aspect ratio of any release print could be varied all the way from the standard 1.33-to-1 up to 2.55-to-1 merely by a simple twist of a knob on the Tushinsky lens.

This, of course, is not the case. Specially-made anamorphic prints for different aspect ratios ranging from 1.85-to-1 through 2.55-to-1 would be required. The Vista-Vision anamorphic print is designed for projection at an aspect ratio of 2-to-1. This ratio cannot be varied more than a small amount without causing unpleasant distortion on the screen.

Two Different Prints

Aspect ratios below 2-to-1 are to be obtained by using the other unsqueezed VistaVision print (there will be two prints available) and then using different aperture plates and different focal-length lenses for each aspect ratio.

Another innovation with VistaVision is the framing marks shown in the upper right-hand corner of the picture frame in Fig. 3. These markings are to be made less apparent than changeover markings and are to be used by the projectionist in gaining proper framing.

Screen Image Framing

The framing marks appear only at the head end of the 2000-foot reels. The first such marks will appear approximately 5 feet in from the start of the reel, and the second set of marks will appear 8 feet in from the start of the reel.

In framing for a 1.33 to 1 picture, the projectionist will frame just above

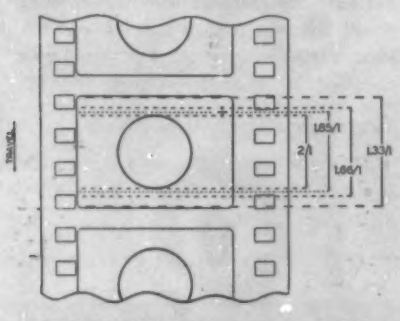


FIG. 3. VistaVision standard release print

the top frame line, in keeping with past practice.

If the picture is being projected in the aspect ratio of 1.66 to 1, the top frame line of the picture as seen on the screen should just cut the line. For a picture projected in the aspect ratio of 2 to 1, it should be just possible to see the bottom dot at the top of the screen.

In operation, the projectionist will complete his changeover operation and, while he is looking through the port, he will observe the position of the first set of dots. If the framing is incorrect, he will make a correction and gain a check observation by viewing the second framing signal.

Framing on VistaVision prints will be at the top of the frame in keeping with the prevailing practice.

A Bitter Lesson Learned . . .

Carthage had its counterpart in the spectacle staged during the first few days of May 1954 when the exponents of the 2.55-to-1 visual image, plus so-called "stereophonic" sound, admitted publicly that they might be wrong. Thus prevailed the lone voice among the trade press (IP), all but stilled by the raucous, if unreasoning, chorus of adulation emanating from the recipients of press handouts.

Banished is the utter nonsense of curved screens; relegated to the darkest caverns of idiotic thought is the so-called stereophonic sound; riddled is the senseless theory that one must show a picture of grotesque proportions which violates the rudiments of physiology and psychology.

IP, for its part, feels that as the sole reportorial agency in the motion picture business which has consistently fought this perversion of technological standards, it has served the common industry welfare. It has been a long, lonely road.

It is too much to hope that in future that which passes for a critical press in this industry will cease to exhibit a magnificent digestion for handouts from those to whom they are beholden. IP's path now, as in the past and in the future, is clearly defined—the demolition of vague figures having vague thoughts about vital matters.

Par's Electronic Splurge Cited in Corp. Report

Paramount's consolidated earnings last year (1953) increased to $6,779,563, equal to $3.06 per share, as compared with $5,899,871, or $2.52 per share in 1952. Profit in 1952 included a nonrecurring profit from the sale of real property of $559,287; while last year's results included $62,649 profit on sales of real property.

Paramount's operating revenues last year were $111,963,557, against $106,090,044 in 1952. Earnings from operations were up to $12,465,054, compared with $9,445,924. Dividends from nonconsolidated wholly owned companies were $261,102, against $146,215; while dividends from affiliated companies were $515,758, compared with $582,955.

Conceding the value of such "dramatic technical improvements" as CinemaScope, wide-screen, 3-D, and innovations in sound projection, Barney Balaban, Paramount prexy, observed that these not only aided the grosses of many pictures, but "more important—they excited public interest in 'movies' generally."

"Significant" Electronic Stake

Paramount, according to Balaban, views these developments as only the beginnings of a permanent enhancement of the film medium, and recalled the company's search for a process to provide a superior picture on any size screen in various aspect ratios. This, he informs stockholders, has resulted in the VistaVision system of photography and projection.

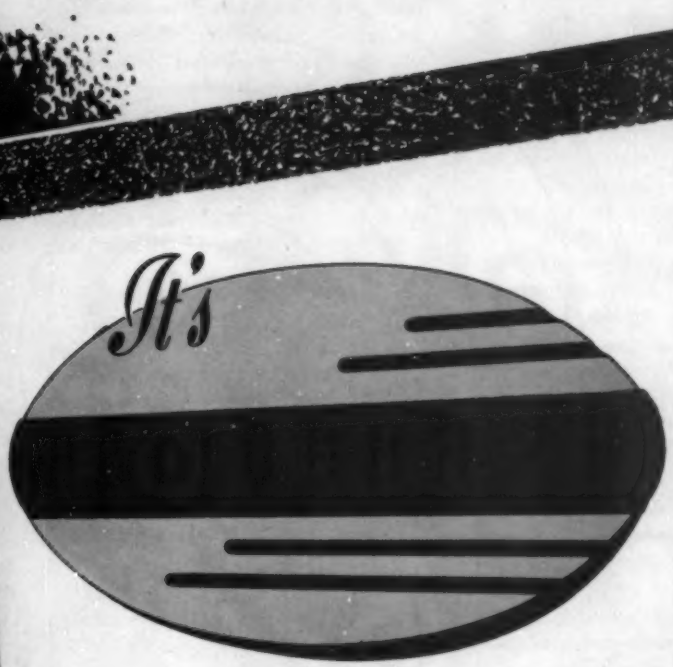
Paramount's "significant stake in electronics," Balaban pointed out, includes about 26% of Allen B. Du Mont Laboratories; 100% of station KTLA, Los Angeles; 50% of Chromatic Television Laboratories, and a majority interest in International Telemeter Corp. (pay-as-you-see Tv).

More VistaVision Cameras

The Technicolor Corp. is building six VistaVision cameras by modifying the same number of its regular 3-strip color cameras. Film runs horizontally through the VistaVision camera, permitting an oversize image to be registered sideways on the film. When this negative is used to make a smaller standard-size 35-mm print, there is a gain in sharpness which is particularly useful in wide-screen projection.

Among the Connoisseurs

IN THE FINEST THEATRES
. . . AT THE BETTER DRIVE-INS



The choice above all other theatre equipment by the projectionist and managers who know. In theatres where a ticket buys a perfect performance you'll always find Motiograph, the finest in all sight and sound equipment.

"Craftsmen to the Theatre Since 1896"

PROJECTORS

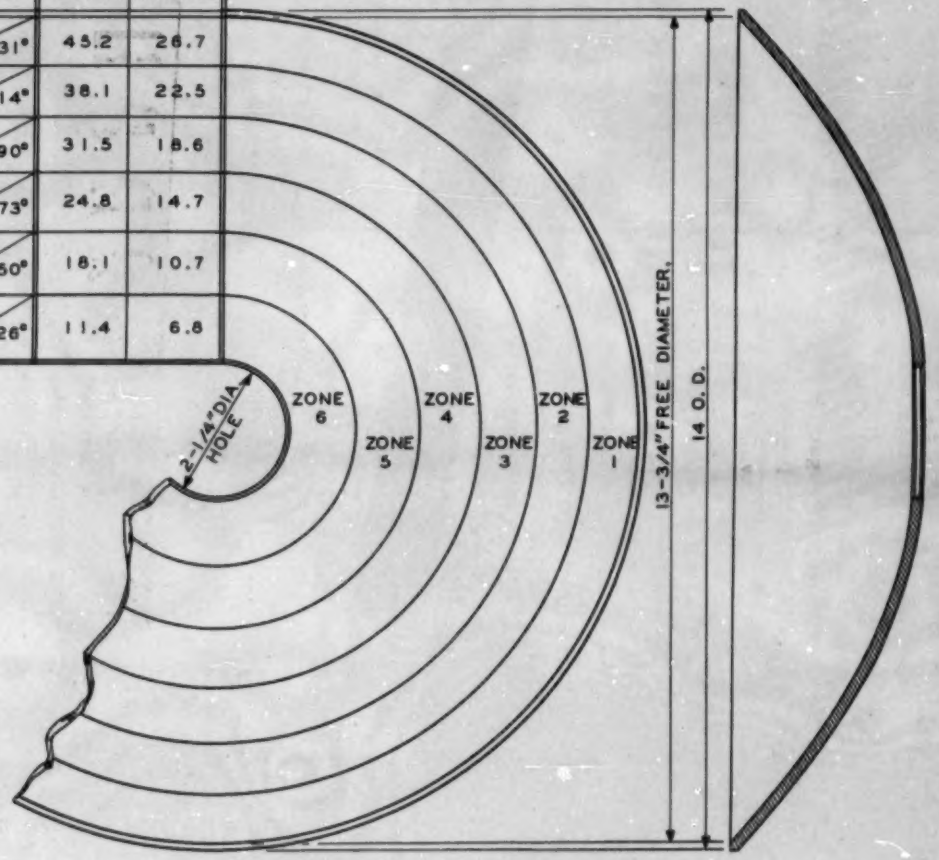
CONTINUOUS-DUTY MOTOR—GENERATORS

IN-CAR SPEAKERS

SOUND SYSTEMS

MOTIOGRAPH

* WITH .715"X.912" CINEMASCOPE APERTURE			† WITH .600"X.825" SOUND APERTURE				ZONE AREAS	
SCREEN LUMENS PER ZONE	SCREEN LUMENS PER SQ. IN.	% OF TOTAL LUMENS	SCREEN LUMENS PER ZONE	SCREEN LUMENS PER SQ. IN.	% OF TOTAL LUMENS	ZONE INCLUDED PICK UP ANGLE	SQ. IN. AREA OF ZONE	% OF TOTAL SURFACE
2,270	50.3	10.2	1,734	38.4	10.2	146° / 131°	45.2	26.7
3,871	101.6	17.4	2,958	77.6	17.4	131° / 114°	38.1	22.5
6,697	212.6	30.1	5,117	162.4	30.1	114° / 90°	31.5	18.6
4,962	200.1	22.3	3,791	152.9	22.3	90° / 73°	24.8	14.7
2,670	147.5	12.3	2,040	112.7	12.3	73° / 50°	18.1	10.7
1,780	156.1	8.0	1,360	119.3	8.0	50° / 26°	11.4	6.8
TOTAL SCREEN LUMENS.	22,250		17,000					



TOTAL REFLECTIVE AREA 169.1 SQUARE INCHES

LIGHT TRANSMISSION CHART OF PEERLESS *2012 Hy Lumen SILVERED GLASS REFLECTOR

34" APPROXIMATE WORKING DISTANCE.
5-5/32" GEOMETRIC FOCUS.
F/2.1 SPEED.

8-9½ C.C. TRIM USED AT 75 AMPERES, 44 VOLTS.
* 3" FOCUS, F/1.8 COATED PROJECTION LENS WAS USED.
† 3" FOCUS F/1.9 COATED PROJECTION LENS WAS USED

Light transmission of the Peerless Hi-Lumen glass reflector in the various light-area zones.

Backstage at Cinerama

Our good friend and colleague, Jack Gieck, with the cooperation of his publishers, *Movie Makers* (April 1954), has made available to us as an industry service his recent article on Cinerama.

UNTIL RECENTLY the Cinerama process has been cloaked in secrecy. Thus I was elated a few weeks ago when Ed Miller, Cinerama's resident engineer in Detroit, invited me to have a look into the inner sanctum. I could even bring my camera, he said.

On the appointed night I entered Detroit's Music Hall and found Ed at his desk in the cutting room, talking simultaneously to the telephone and to the intercom which connects him with the console operator and the four projection booths. Lining the walls of the room were rewind benches, splicing equipment and enormous square film cans storing Cinerama's 8000-foot reels.

"How's Charlie?" Ed was asking the intercom. Charlie, I figured, must be a member of the crew; but I soon learned that this was the phonetic designation for the left projection booth (the others being "Able" and "Baker," reading from right to left).

Seven Sound Tracks

To review briefly, Cinerama employs three projectors, each in its own projection booth, to cover a screen 66 feet wide by 24 feet high, curved horizontally on a 25 foot radius. The projectors, like the lenses on the camera which made the picture, are set 48 degrees apart to cover a field of 146 degrees on the screen.

Seven tracks of stereophonic sound (representing six microphone locations and one composite track) of extremely high fidelity are recorded magnetically on 35-mm film base. The magnetic sound reproducer is located in the fourth projection booth, situated above the balcony at the rear of the theatre. This booth also houses the standard 35-mm optical sound projector which projects the conventional movie prolog.

The Sound Room

The magnetic sound reproducer is about 7 feet tall with a 31-inch reel housing at top and bottom. The center section contains the soundhead and there are several sprockets to lead the film off the feedreel and onto the take-up reel. I found that all seven magnetic pickups are side by side in a single head narrower than the film width.

(This is in contrast to the Warnerphonic system—a la *House of Wax*, for example—which uses 35-mm magnetic film, but has only three tracks with the pickups staggered along the film.) What is even more surprising, under these conditions, is the absence of intermodulation (crosstalk) between the seven tracks.

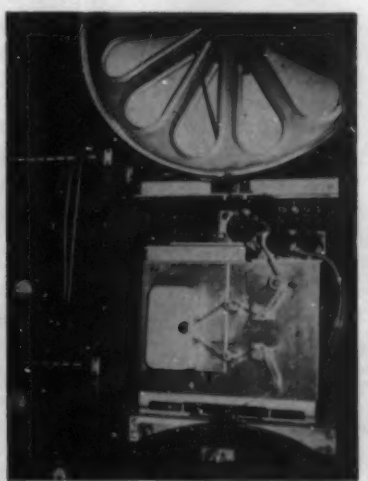
Also mounted on the magnetic reproducer is the heart of Cinerama's synchronization system. Cinerama does not use conventional selsyn motors to keep the three projectors and sound in "locked-in" sync. Instead, they "fall in off the line." Each projector is equipped with a small "slave" synchronizing device similar in appearance to the "master" on the sound machine. In Fig. 2 a black disc resembling a strobe card with 32 white graduations can be seen. Each time this disc revolves, 32 frames, or approximately 3 feet of the film, pass through the machine.

Maintaining Sync

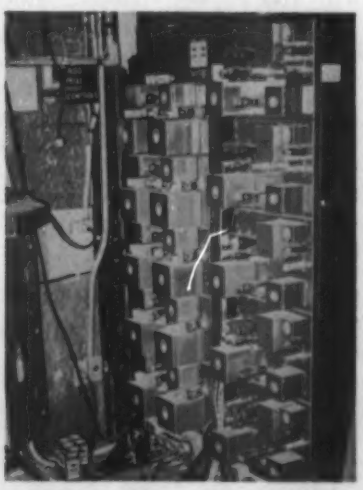
At the conclusion of each revolution the device sends out an electrical pulse to the slave units on the projectors. If the latter are in sync, a green light mounted on each machine flashes momentarily. If one of the projectors is ahead or behind by as little as one frame, the light fails to flash. Instead, one of the two small (6-volt) synchro timing motors—visible in the illustration as the round black objects to the right of the disc—takes over and accelerates or retards the projector by the required amount.

This gadgetry is especially busy at the start of the show. When the projectors are loaded, the films are synchronized on a common start-mark, perforation for perforation. The sound is started slightly ahead of the picture, and the projectors accelerate as required while 15 feet of leader run

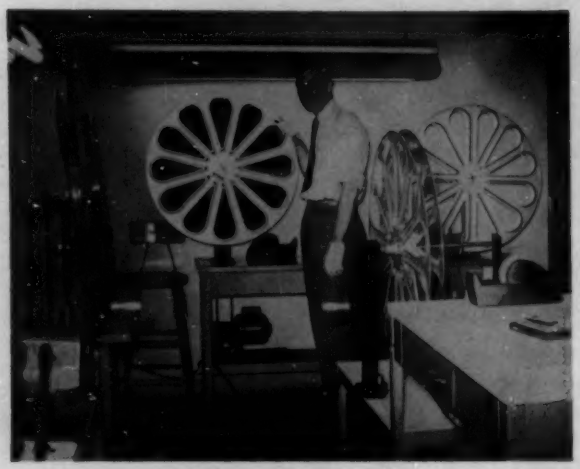
Ed Miller, resident engineer of Cinerama show in Detroit, takes a hand at console.



Seven tracks of magnetic sound on film are scanned by this reproducer.



Amplifiers: Booster at right, power at left—are rated at 75 watts per channel.



In the cutting room projectionist Joe Gates handles Cinerama's 31-inch, 8000-foot reel which, when loaded, weighs from 75 to 80 pounds. From the looks of these babies, projecting Cinerama would seem to be a job for a man with muscle.

through them, so that all four machines are in step by the time the picture appears and the dousers (arc-house shutters) swing open.

Since this sync mechanism is not completely foolproof, the green pulse-lights also appear on the console board in the center of the theatre, and the console operator can correct any projector from his control panel. We'll have more to say about the console later on.

To the left of the reproducer the preamplifier panel may be seen. The plug cords hanging down are used for "patching" in case one of the magnetic pickups should fail. That is, in case one sound track is not being reproduced, an adjacent track can be spread over two of the auditorium speakers to avoid a dead spot behind the screen. This also can be done from the console, as we shall see.

The Projection Booths

Leaving the sound room, we went downstairs to one of the projection booths—*Able*, to be exact, on the extreme right. The projectors are built especially for Cinerama. Though the arc-house and the basic casting are standard projection equipment, the interior of the head is drastically modified. For example, the frame size on standard 35-mm sound film measures 0.631 by 0.868 inches. Cinerama's frame is half again as high—with six perforations per frame instead of the usual four—and runs to the sprocket hole edges on both sides (since the optical sound track is eliminated). The resulting frame is slightly taller than it is wide—that is, 1.119 by 1.000 inches.

Further, there are the "jiggilos" on each side of the aperture to dodge out the sharp vertical lines which would otherwise appear between the three screen panels. These comb-like metal strips are cam-operated, moving up and down once per frame and remaining stationary while the shutter is closed. Jiggilos on adjacent projectors are 180 degrees out of phase. Because they generate considerable frictional heat in the aperture, which is already subject to arc heat, Cinerama projector apertures are water-cooled.

Oversize Reels

We have mentioned the 8000-foot reels used in the Cinerama process. Because the ordinary projector motor would not be strong enough to turn a full reel of this size, an auxiliary torque motor turns the takeup reel. And to counteract its inertia, the feed reel is equipped with a *brake*. All this film does not constitute a fire hazard, however, since Eastman safety film is used.

Because human vision is more sensitive to flicker in the peripheral area of the retina which Cinerama covers, the projectors are operated at 26 frames per second instead of the conventional 24. Combined with the taller frame, this results in a film speed of 146.3 feet per minute compared to the standard 90 for conventional 35-mm sound projection.

Sound System Backstage

After loading his projector and trimming his arc carbons, each projectionist flips a control switch from "local" to "remote," which turns over subsequent control of his machine to the console operator.

Next stop on our tour was backstage, behind the great curved screen. As we stepped out of a rear door onto the stage, the boards vibrated beneath our feet under the impact of the low-frequency "drivers." There are six banks of speakers behind the screen—one for the prolog projector, five for the Cinerama sequences. Each consists of two 18-inch, low-frequency reproducers ("woofers") and two exponential high-frequency horns ("tweeters"). All are Altec-Lansing equipment.

In the auditorium there are nine additional banks consisting of one woofer and one tweeter each. These are distributed as a left wall and right wall bank on each audience level, as well as a rear wall bank behind the audience on each level.

The booster and power amplifiers (Altec-Lansing models 126 and 247-B, respectively) for the stage speakers are located on the stage as close as possible to the speaker banks to avoid power and fidelity losses. Amplifiers for the side speakers are installed in the side projection booths (A and C) downstairs. The rear speaker amplifier is the center booth (B) and also serves as a standby amplifier for the composite track.

For audiophiles interested in the amplifier tube layout, the preamp for each channel (located in the sound room) contains a 1620 and 6SJ7; these are coupled into the booster stage (near the speaker) which consists of a pair of 1620's driving a pair of 6L6's in turn driving a pair of 807's in the power amplifier. The output transformer is the size of a small doghouse and the power rating for each channel is 75 watts, giving Cinerama a potential power output of nearly 600 watts! Needless to say, it has never been opened up—the building might fall down!

Faster Tape Speed

Another factor contributing to Cinerama's high fidelity sound (which faithfully reproduces frequencies from 30 to 15,000 cycles per second) is the linear operating speed of its magnetic tracks. While home tape recorders get along on tape speeds of 3¾ or 7½ inches per second, and hi-fi or broadcast equipment generally runs at 15 i.p.s., it will be noted that 146.3 feet per minute (which is the film speed) comes out 29¼ inches per second. You can put a lot of stuff on

(Continued on page 30)

Simplex dual in-car stereosound speakers shown mounted on special bracket, four to a post. One speaker is attached to each side of car for stereo affect.

Simplex Dual-Speaker Stereo Sound Available for Drive-In Theatres

HIGH-QUALITY sound distribution within the limited area provided by a car parked in a drive-in theatre has long posed a most difficult problem for designers and development engineers. Of late, these technical personnel have been engaged in offering to the drive-in patrons an approximation of true binaural hearing.

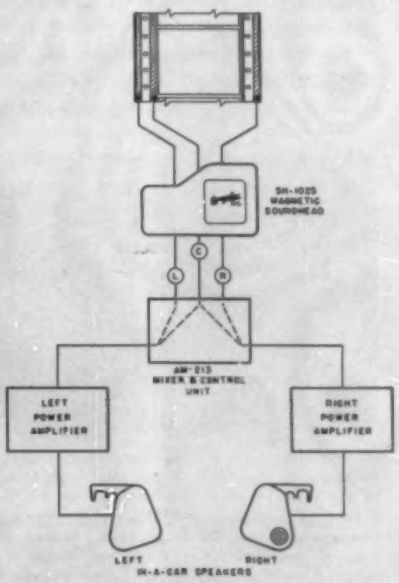
In the forefront of the technological ranks which accepted and successfully met this challenge to their abilities were, among others, the engineers of International Projector Corp. The result of this engineering and production talent is evident today in the Simplex dual-speaker system for drive-in theatres — a method whereby binaural reproduction is accomplished within an automobile.

In the Simplex system the three channels of CinemaScope sound are fed to both the No. 2, or middle, channel being split to serve both speakers with that degree of sound which gives balance. In addition to the double-speaker wiring and post equipment, a special "mixer" for combining the sound from the center track with left and right channels is required. Also needed are "penthouse" soundheads.

Once a drive-in has installed the Simplex system of stereosound, it can reproduce any type of sound now available. Its regular soundheads can handle standard optical sound or the Fine Perspecta system of optical stereosound, reproducing it in the standard one-channel way. In addition, the drive-in, when equipped with the Simplex system, will be able to reproduce CinemaScope magnetic sound.

Installation Modus Operandi

Now, in existing installations having a three-wire underground system, the Simplex unit may be used provided that the exhibitor is willing to sacrifice the individual speaker-stand light. If, on the other hand, an exhibitor wishes to "start from scratch" he may wish to install a four-wire underground system which will enable him to employ the dual-speaker arrangement and also retain his speaker-post light.



Graphical representation of the Simplex in-a-car speaker system which delivers stereophonic sound. Volume control knob is shown on the right-hand speaker.

It follows, naturally, that new speaker-post brackets would be required to accommodate ("hang") the two speakers which would replace the single-speaker bracket formerly used. Any existing drive-in theatre having a minimum of three-wire underground wiring will, at the sacrifice of only the post light, be able to use this Simplex and similar drive-in systems. On a new project, it would seem to be the better part of wisdom to install the four-wire system which would accommodate a light for each speaker post.

Further detailed data anent any drive-in situation will be forthcoming promptly, at no charge, upon request to IP.

DuMont's 19-Inch Color TV

A progress report on color Tv made by Du Mont Laboratories has disclosed a 19-inch color picture tube which delivers a picture almost equivalent in size to a 19-inch black-and-white tube.

Du Mont stated that the simplicity of the tube's design and its inherent picture clarity may bring mass production of large screen color television at a reasonable price within two to three years. This apparently means that the small screen color receivers presently being offered have been rendered obsolete.

The tube is called the Du Mont "Chroma-Sync Teletron." It has a 19-inch glass envelope with a round face plate and produces a picture of 185 square inches, more than twice the size of pictures of color receivers currently being marketed.

Universal's Profits Rise

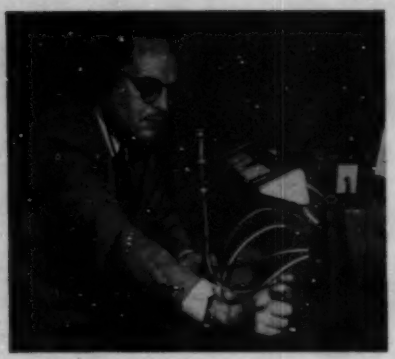
Consolidated net earnings of Universal Pictures and subsidiaries for the 13 weeks ended January 30 last were $772,979, after provision of $800,000 for federal taxes. This figure represents the biggest Universal first quarter since 1946, and compares with $475,888 after $675,000 tax provision in the same period of the previous fiscal year.

Another Tv Extravaganza

David O. Selznick has signed a contract to produce a two-hour multi-network Tv show next October 24, marking the diamond jubilee of the electric light. The show will be the most expensive in the history of Tv, costing substantially more than the Ford 50th Anniversary show of last year, or the recent Rodgers and Hammerstein cavalcade sponsored by General Foods.

IN THE

SPOTLIGHT



Jim Day, Local 199, Detroit, had worked 652 Cinerama shows when this picture was made at control console which he is operating.

ONE of our boys—Jim Day by name and by affiliation a member of IA Local 199, Detroit—is currently enjoying a solid year-plus experience with Cinerama at the Music Hall Theatre in that famed Motor City. Jim is by way of being a mere amateur, since by the time these words appear in print he will have supervised 700 presentations of the intricate Cinerama showings.

Of blessed memory is Jim Day's observation that "there are no *chief* projectionists at the showings of Cinerama at the Music Hall Theatre. The men of our crew are *all* particularly well qualified to run Cinerama, or any other professional showing in the world."

Successful presentation of Cinerama in Detroit (as detailed elsewhere in this issue) or in any other city is dependent upon the teamwork of well trained crews and not on any one man. All of the men are experienced showmen.

For instance, Gary Lamb, console man on one team, joined Local 199 in 1916; Joe Gates, of this crew, 1921; William "Pop" Stolz, 1912; Michael Ureel, 1921; Marius Duffourc, 1912—about 190 years of experience between them. The other team consists of Glenn Harnden, 1918; Bruce Greenhaw, 1919; Matt Haskins, 1919; Ross Campbell, 1920, and Roy Light in 1929. A grand total of about 365 years of experience for the group.

Jim Day was console man for about 400 of Cinerama's 880 shows. He started with Cinerama in February 1953. A member of Local 199 since 1929, Jim has worked in various theatres in Detroit as projectionist, and on the road for Jam Handy. He was with Altec Service Corp. as sound engineer for about 6 years, and was also electronic technician on the large-screen Tv set-up at the Michigan Theatre, Detroit. He opened station WXYZ-Tv as projectionist and was with them for about two years. Born November 25, 1908. Got his first "ham ticket" for W8NJT in 1935, and has held commercial radio operator's licenses for years but never worked at it. Jim's family includes Mrs. Jim (Jackie) and one Cub Scout, Matty Day, 8 years old. Jim is a member of Daylight Lodge, F. and A. M., No. 525. Radio and quality sound are his hobbies. Since Ed Miller left to go back to Altec Service Corp., Jim has been working at Cinerama as resident technician.

• Local 332, Clinton, Iowa celebrated its 40th anniversary last month at a stag luncheon party which was held at the Labor Temple there.

• A recording of a discussion between Nelson Cruikshank, director of social insurance activities for the AF of L, and Andrew J. Biemiller, member of the AF of L national legislative staff, which helps to clarify the AF of L's attitude toward the government's social security proposals, is now available to all labor unions.

The AF of L representatives discuss each of the six points of the Eisenhower program, and they also explain the improvements recommended by the Federation. The record plays at 33⅓ rpm, runs 13 minutes, and costs $5.50 each. It may be obtained from the Workers Education Bureau, 1625 Eye St., N. W., Washington 5, D. C.

• One of the out-of-town visitors to the offices of IP the early part of this month was Anthony De Cosmo, business representative for Local 152, Hazelton, Penna. He had quite a gaff session with IP's editorial staff on the merits of the various projection processes now very much in the news.

• Following the expiration of the contract with Local 607, Kittanning, Penna., the owner of the Super 66 Drive-In Theatre refused to negotiate a new contract with the IA Local, and at the beginning of the present season employed projectionist members of the Construction Workers Union, which is affiliated with No. 50, United Mine Workers of America. Peaceful picket-

Members of the "Old Timers Club" of Music Hall Theatre, Detroit, Mich., as they gathered at the festive board in celebration of the first anniversary of the Cinerama showing at this theatre. This Club is comprised of employes who have been with the theatre since Cinerama first opened there in March 1953. Seated, left to right, are: Ross Campbell, Michael Ureel, Bruce Greenhaw, James Day, and Joseph Gates, members of Detroit Local 199. Shown at the extreme right is George Santer, house manager. Standing, left to right: Frank Upton, managing director; Betty Dolan, chief of service; William "Pop" Stolz, Local 199; Evelyn Hunter, ass't chief of service; Harry Pollack, Stagehand Local 38; Gary Lamb, Local 199; Si Finley, Local 38; William Loll, theatre treasurer; Jane Thom, ass't treasurer; Russ Russo, ass't manager; Adeline Messerschmidt, ass't treasurer; Mrs. Knapp, head cleaner, and William Green, director of publicity.

ing by Local 607 has been so effective that the theatre owner appealed to the courts for an injunction to restrain the IA Local. Local 607 maintains its right to picketing of the drive-in on the basis that workers from another jurisdiction have been brought in to replace IA men.

• Good news it is that Arthur Sullivan and Philip Levine, members of Local 96, Worcester, Mass., who suffered heart attacks and were hospitalized about the same time, have left the hospital and expect to be back at work within the next few weeks.

• Winning ski tourneys has become a commonplace with Jim and Bill Georgas, members of Toronto Local 173. Taking part in a number of important ski meets in Ontario, Canada, during the past season, the brothers Georgas took either first or second place in many of the events.

In the Huntsville (Ont.) meet, Jim copped firsts in cross-country, downhill, fourway, Alpine, and Nordic; second in slalom, and third in jumping. Competing in the very difficult run at Collingwood, Southern Ontario, he won the cross-country, Alpine, Nordic, and the fourway. He was second in slalom, and third in downhill. He is hopeful of making the Olympic team. At the same meet, Bill won first in downhill, second in Alpine, Nordic, and fourway, and third in cross-country.

To add to this excellent record, Jim and Bill Georgas rescued a skier who was lost and had been buried in the snow for several hours.

Jim and Bill Georgas, members of Toronto Local 173, hold many ski-jumping awards.

• Herbert F. Slater, Sr., business representative for Providence Local 223 since 1926, was honored at a surprise dinner given by the Local immediately following the April meeting. In appreciation of his successful stewardship of the Local for the past 28 years, Slater was awarded a gold life membership card. A tape recording entitled "This is Your Life, Bill Slater," accompanied by old pictures shown on a balopticon describing highlights of his life from infancy to the present date, was a feature of the party.

Philip Sugarman (left), vice-president of Local 223, Providence, R. I., is shown presenting a gold Life Membership card to Herbert F. Slater, Sr., business representative for 28 years.

• Claude E. Watkins, projectionist at the Strand Theatre in Troy, N. Y., and member of Local 324, Albany, N. Y., is a proud dad these days now that his daughter, Nancy, was elected to the national honorary society for home economics students, Omicron Nu. Nancy is a student at Syracuse University, where she is majoring in social work.

Watkins has been a member of the Albany Local since 1921 and in past years served as both president and business representative. In 1936 he was elected for one term as president of the N. Y. State Projectionists' Association. He has held his present position at the Strand Theatre in Troy for the past 33 years.

IA ELECTION

LOCAL 195, MANCHESTER, N. H.

Leo R. McIntyre, *pres.*; Arthur A. Smet, *vice-pres.*; Thomas P. Swist, *sec.-treas.*; Samuel F. Cooley, *rec.-sec.*; Arthur A. Smet, *bus. rep.*; Ernest Gunderman, Maurice Watts, George Nightingale, *executive board*; A. A. Smet, *del. to IA Convention.*

• Prize-winning suggestions in our final Polaroid-IP contest were submitted by George A. Hartnett, secretary of Local 286, Des Moines, Iowa. We hope he will enjoy the use of the Polaroid-Land camera awarded him for his suggestions.

Back in 1912, George Hartnett, together with several other projectionists, helped organize Local 286, which was granted an IA charter the following year. Since then he has served the Local as president, vice-president, business representative, and for the past 20 years has held the office of secretary. In 1933 he helped form the Iowa State Association, IATSE, serving as its secretary-treasurer ever since. For the past 21 years he has been auditor for the Iowa State Federation of Labor.

Fine Legislative Record

In the 1933, 1935, 1937 sessions of the Iowa General Assembly, Hartnett waged a vigorous campaign for the enactment of legislation providing for fireproof construction of projection rooms, and for other fire-preventive measures in connection with theatres. He authorized a booklet "Fire Hazards of Motion Picture Film," which was widely circulated among IA Locals that were conscious of the ever-present danger.

Born in Port Angeles, Wash., in 1891, Hartnett has made Des Moines his home since 1901. He has held his present position as projectionist at the Des Moines Theatre for the past 26 years. He is a veteran of World War I, having served with the Second Division in France and Germany. For the past 15 years he has been Legislative Officer, Department of Iowa, Veterans of Foreign Wars. He has a son, John, 18, now a member of the U. S. Air Force.

Lou Hammond, holder of No. 1 Seniority card in New York Local 306. Lou was for many years "Mr. Strand", by reason of having opened the Strand, Broadway, N. Y., first "presentation" house in the world.

Brush-up on Fundamentals

Rectifiers for Projection -- Conclusion

DURING one half cycle of A. C. voltage introduced to the selenium cell, its base plate is negative while the barrier is positive. At this instant free electrons converge upon the base plate which is a good conductor. These free electrons, under voltage pressure, pass through the thin selenium barrier to the contacting alloy on the other side; a current flows from the base plate to the alloy.

During the next half cycle, the base plate becomes positive and the selenium barrier negative. Ordinarily the flow of current would reverse but the barrier, being a very poor conductor, does not accumulate the quantity of electrons necessary for a flow from the contacting alloy through the barrier to the base plate. Since only half of the alternating cycle has been passed the output is a pulsating direct current. This entire action is shown in the simple schematic of Fig. 4A. We note at once the lack of requirement for an "A" potential as shown in Fig. 1 for the simple diode tube. This is a talking point for selenium versus the vacuum tube. Full wave rectifying circuits for these units may be set up in the same manner as described for diodes and as shown in Fig. 4B.

Operating Precautions

While projection rooms do not offer some of the hazards attendant on selenium rectifiers it might be well to pass along a warning or two. These units should not be installed in explosive atmosphere or where they will be exposed to mercury vapors. Adequate ventilation is always required. The stacked rectifiers should be mounted so that their fins are positioned vertically in free space to allow for heat radiation. No other heat producing equipment should be nearby. In surrounding temperatures of 110 degrees F. or higher the unit should be operated below its normal rating. This will prolong life and avoid trouble. While simple seleniums have no moving parts, most theatre-type units have a fan mounted at the top for forced air cooling. This permits operating at heavier current loads.

Do not use an ohmmeter to check a selenium rectifier. Its non-linear resistance will produce erroneous readings. A test voltmeter or ammeter will detect any abnormal conditions. If the voltage output is low and no overload condition has occurred, check the associated components as described later under "Trouble Shooting." The chances are that the rectifier itself is good. If not, the best thing to do is not to fool around with it. Get a new one. There is no more chance of local correction than there is with a blown vacuum tube. However, the manufacturer can rebuild the cells of selenium whereas defective vacuum tubes are useless. When voltage control is critical, inductive voltage regulators should be installed. The manufacturer will provide data on this.

Prolonged Overloading

Momentary overloading of current output should cause no damage to a selenium. However, a prolonged overload, such as a shorted load, will damage the rectifier. Overload breakers or fuses should be used. Locate the external short as speedily as possible and correct it before applying power to the rectifier.

Excessive voltage will cause damage. Watch the rating otherwise you're likely to cause a breakdown across the selenium barrier and ruin the unit. Seleniums are somewhat self-healing but miracles must not be expected. When a sustained over-voltage breakdown occurs, the odor of selenium fumes will warn the projectionist and give him a chance to shut off the power, and if he's lucky, switch to a spare rectifier.

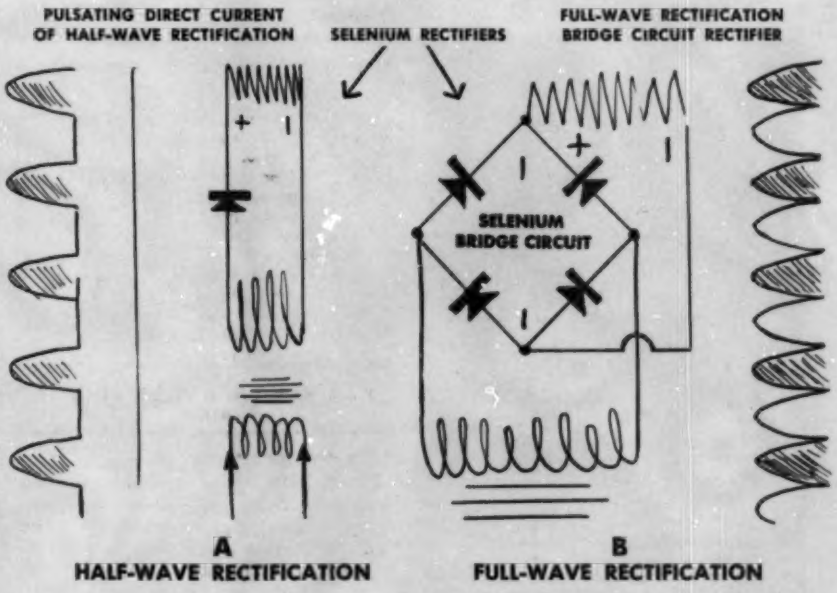
Filters

The basic rectifiying circuits described here produce a pulsating direct current. These pulsations represent the rectified alternations of the original AC current supplied to the rectifiers. It is generally necessary to smooth out these pulsations to obtain a more consistent or unvarying direct current. This is accomplished by means of filters comprised of chokes and condensers. These should be a part of the original installation. Primarily, filters utilize energy storage characteristics and the rise and fall of voltage is smoothed out and a steady output obtained.

Voltage Regulation

A five per cent drop in voltage output may be expected after the first few thousand hours of operation to a natural aging process inherent with selenium rectifiers. The drop, however, may be no greater than this even after 10,000 or more hours. To overcome this slight fall-off a tapped trans-

FIGURE 4



former may be used to boost the input voltage by the required amount.

Most rectifiers have some ripple content which, of course, is the reason for the filters. For a single-phase bridge circuit the ripple will be twice the frequency of the source, triple for three phase.

Trouble Shooting

Warning: Voltages developed within power supplies are, to put it mildly, injurious. In other words, you can be knocked head over heels. Shut off power before attempting any service within one of these units.

Filter condensers hold a considerable charge for a month or more if there is no leakage. Thus the better the equipment the greater the danger. Such storage voltage in the higher voltage television units has caused fatalities among servicemen. Before going ahead with any work be sure to discharge each condenser terminal to ground by securing wire jumper first at ground and then applying the other end of the jumper individually to each condenser terminal.

Diode tubes are something else again. They can be checked quite easily by the simple expedient of substitution, using a new tube each time. Never install a different type or rating of tube unless the service engineer or the manufacturer's manual sanctions it. If trouble persists, check the chokes, filter condensers, bleeder resisters and wiring. If a component is scorched or carries an odor of burnt insulation, replace it. The same holds for wiring. Insulation must be good between chassis ground and condensers and resisters. Check with an ohmmeter or continuity meter. No through circuit should be indicated. Replace any condenser showing any signs of internal leakage.

Fairchild's Sound Division

The Perspecta system of recording and reproducing sound received a fresh and powerful impetus during the past month with the announcement by Fairchild Recording Equipment Co., of Whitestone 57, New York, of the establishment of a special Motion Picture division to manufacture, sell and license this new process. Fairchild is a famous name in the field of precise instruments, including the world-famous Fairchild aerial photography cameras.

Delivery of the first "integrator" units for the Perspecta system, developed by C. Robert Fine, is now progressing. The Perspecta system is the first "compatible" theatre sound system which permits reproduction of three-speaker stereophonic sound from a single optical track, or via the conventional one-speaker setup. M-G-M and Paramount, among others, have announced the availability of Perspecta prints for all future releases.

Perspecta requires no variance in standard projection procedure — in fact, Perspecta film may be spliced into conventional film, and the switchover is automatic via the "integrator".

Ray Crews, in charge of this new Fairchild division, formerly supervised sound recording at Paramount and was at one time manager of the Westrex subsidiary division.

Dubbing in English

Shortage of film product, resulting in an increased demand for foreign-made pictures in American theatres, has started a trend to dubbing in the English dialogue. Dubbing American films in foreign languages has long been a practice in Hollywood.

It is pointed out that most foreign actors speak English to a greater or lesser extent but that their accents make their voices unacceptable to audiences here. By speaking their lines in English, even if badly spoken, for the cameras the actors at the production centers abroad make it simple to do the dubbing here and still maintain proper lip sync.

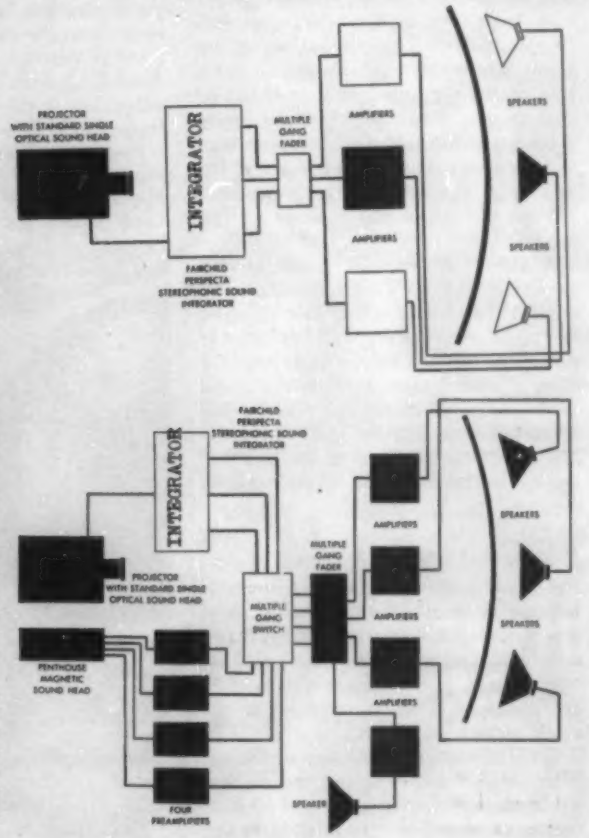
Projector, Lens Cleanliness a Magnetic-Film 'Must'

The reproduction of magnetic soundtracks poses a problem for projectionists that has received no attention—the depositing of the iron filings with which magnetic prints are treated all over the projector, including the back end of the lens, during the film-transit from the upper magazine to the penthouse reproducer, to the head and on to the lower magazine.

This condition may be caused by the air current set up by the rear shutter, or by the constant stream of air produced by the use of an air-cooling blower, or by a combination of both.

Absolutely required: the constant cleaning of the projector and the removal of the gate at least three times daily in order to remove these deposits from the lens.

The failure to perform this work is due to lack of manpower in many projection rooms, the penalty for which is a most unsatisfactory screen image.



Here is a graphic representation of the Perspecta (Robert Fine) single-optical track system of recording and reproducing sound. Paramount is definitely committed to this system for all future releases, and M-G-M is going along. This Perspecta sound system incorporates on a single optical track, 100 mills wide, the means for reproduction in the theatre of either the stereophonic effect through a 3-horn setup, if available, or the straightaway sound reproduction through a single horn. The economic and technological appeal of the Perspecta system is that it can be shown in any theatre in the world with existing, standard projection equipment without a nickel's extra expenditure. As shown here the existing equipment (prior to the Perspecta installation) is indicated in the black areas.

What's Your Problem?

Projectionists whose problems appear herein will each receive a $5.00 check from IP. What's YOUR problem?

QUESTION. *We have Simplex-Hi lamps operating off two separate 4-bulb, Tungar-type rectifiers, rated at 40 amps., 27 volts. Each lamp has an ammeter but no voltmeter. Recently one of the lamps developed trouble which we have been unable to overcome.*

The current reads in the vicinity of 25 amps., and the automatic carbon feed is very erratic. The usual tendency is for the carbons to drift toward the front of the lamphouse, with the gap becoming very short; sometimes the carbons run together.

On an average of about one nightly, however, the carbons pull apart and we lose our light. I feel that this trouble may be due to the Tungar bulbs, which are old, or to high resistance in the leads from the rectifier to the lamp. I would appreciate your opinion on this.

KENNETH G. ALLEY
IA Local 421, Herrin, Ill.

ANSWER. Your difficulty may result from defective Tungar bulbs. In this type of rectifier two bulbs are paralleled through a load-dividing transformer on each half wave of the rectifier output. If one bulb becomes defective or operates intermittently, it throws an overload on the remaining bulb on that half of the wave. This tube will consequently overheat, and in addition the arc voltage will become reduced 2 to 3 volts, which will cause the arc gap to shorten and occasionally cause the carbons to run together.

A check to see that all tubes are operating can be made by holding a small mirror down along the sides of the tubes and looking at each tube in turn from the side to determine whether there is a blue flame between the anode and filament of each tube. This bluish flame indicates that the tube is rectifying. Any tube not found to be rectifying should be removed and a replacement inserted.

Incorrect Ammeter Reading

A second possibility is that the ammeter may be reading incorrectly. You report that sometimes it reads approximately 25 amperes. The natural inclination of most projectionists would be to accordingly turn up the rheostat to get more current.

This, of course, would cause the carbons to be fed faster, and the current would go up, thus causing the positive carbon to burn faster in relation to the negative than the design of the lamp contemplated. As a result, the entire arc gap would drift forward toward the front of the lamphouse and become rather short. Then, if the carbons actually freeze, the crater is destroyed and the lamp would very likely go out.

Resetting Motor Feed Rheostat

We would suggest resetting the motor feed rheostat, reducing the setting until there is no further drift of the arc toward the front of the lamphouse, and also increase or decrease the rectifier setting to obtain the correct arc gap.

If the gap is longer than the approximate 1/4th inch, the rectifier tap switch should be set at a lower point. If the arc gap is shorter than 1/4th inch, the rectifier tap switch should be set up to a higher tap.

Hilux F:1.8 Lenses Now In Volume Production

The ready and widespread acceptance being extended to its new F:1.8 Hilux projection lens is due to a variety of compelling reasons, states its manufacturer, Projection Optics Co., 330 Lyell Ave., Rochester, N. Y. This upsurge in orders has necessitated additional manufacturing facilities.

Projection Optics cites the following reasons for the Hilux lens demand: 1. Speed—F:1.8; a new anastigmat formula; one piece hermetically-sealed mount; no cement failure—no re-cementing; all air-glass surfaces precoated; minimum vignetting, and maximum screen brightness.

Projection Optics' new Super-Lite Hilux F:1.8 wide-angle lens

The Hilux lens series, designed especially for maximum edge-to-edge definition for wide-screen applications, are at present available in focal lengths from 2 to 3½ inches, with more to come. The price of these new lenses is $270-and-up per matched pair, through theatre supply dealers. National distributor for the Hilex lens is Raytone Screen Corp., 105 Clermont Ave., Brooklyn 5, N. Y.

British Film Tax Reduction

The Chancellor of the Exchequer, in his Budget Speech on April 6, 1954, in the British House of Commons, announced a reduction in motion picture theater entertainments duty. It is estimated that the reductions will cost the Exchequer about 3,500,000 pounds sterling a year. The reduced levies go into effect from May 30, 1954, and provide reductions in duty ranging from a half-penny on the lowest priced tickets to 1½ pence for admissions of 4 shillings. Theater seats up to and including 9 pence will be free of tax, whereas the present tax rates exempt tickets costing up to 8 pence. (One pound sterling equals U. S. $2.80, there are 20 shilling to a pound, 12 pence to a shilling.)

The tax reduction will not result in lower admission prices. In effect the tax reduction will be absorbed by the film industry and will be shared between exhibitors and producers. Immediate trade reaction to the tax reductions was one of surprised approval.

Film Biz in the Antipodes

During 1953 there were imported into Australia a total of 400 feature-length 35-mm films. Of these, 287, or about 72% of the total, were U. S. films, 68 were British, and 45 were from other countries. One Australian film was released in 1953. This compares with a total of 390 feature films imported in 1952, of which 290, or about 74% were U. S. films, 72 British, and 28 from other countries.

Of the 401 feature-length films passed for commercial exhibition, 292 were classified as suitable for general exhibition, and 109 as not suitable for exhibition before children under 16 years of age. Only one feature film was rejected in 1953.

Pola-Lite for Foreign Use

Negotiations have been completed for the manufacture and distribution of the Pola-Lite single film 3-D system in the United Kingdom and Canada. G. B. Kalee, Ltd., will manufacture units for distribution throughout the United Kingdom and British possessions, Europe, Latin and South America.

In Canada, the Pola-Lite units will be distributed by General Theaters, a division of Famous Players Canadian Corp.

To the Editor of IP:

Being intensely interested in the topic of all-purpose screens for the new processes, I should like to append a few observations thereon.

There is, without doubt, a trend to the installation of screens with seamless construction or a construction that effectively makes any seams invisible. Today's wide-angle photography utilizes large panoramas, very often showing large areas of sky, desert, snow, etc. In such instances seams are particularly objectionable.

In addition, a uniformity of surface is required, thereby eliminating such light seams perfect and therefore any streaks or shades.

The question of light distribution has been given quite a going over. Once again we notice a trend toward screens with higher brightness and better definition for the *best parts* of the theatre, the exhibitor being satisfied in the majority of cases with the inferior light distribution in the very front seats to the extreme sides. His preference is a natural one since he does not want to sacrifice quality of projection for the benefit of the only seats in his theatre that cannot always be filled and which have undesirable viewing angles.

The screen manufacturer is faced with the problem of evaluating the more important features of his all-purpose screen. The older and well established screen manufacturers seem to prefer uniformity of surface and good definition to features that would be detrimental to such results.

LEONARD SATZ

Raytone Screen Corp., N. Y. City

To the Editor of IP:

In view of the current confusion on the subject of splicing CinemaScope film, I submit the following:

All it requires to make a good splice in *any* film is a good film cement and a little common sense. I think it is a smear on the capability and intelligence of the projectionist to suggest that he will have trouble splicing CinemaScope or any other type of film. If he is capable of operating the equipment they throw at him today, he surely is capable of splicing film, regardless of type.

I am enclosing a small block of wood 1/2-inch square. You will note that it has a piece of sandpaper glued to two sides. This little block, which any kid could make, serves as a dry emulsion remover and a roughing block to rough the splice area on *both* the emulsion and shiny side of the film. The block is used *with a light touch* and does a good job. The wire brushes that someone has recently been trying to sell projectionists are not needed.

At our laboratories we have tried just about every method of preparing a film for splicing, and we find that these little blocks really do the job. We have sent a quantity of these blocks to our dealers, they were very well received. Some manufacturers of raw film stock tell you not to use sandpaper. They claim that it will cause damage to projector parts and get on the film, causing scratches. This we firmly disbelieve.

We believe that if a splice is made right and a good film cement is used, there will be no problem in splicing film and, I've made a lot of splices in my day.

As you probably know, I own the company that makes Ethyloid film cement. Our business has increased 40% in the past year, and we have had no complaints about splices pulling apart. Ethyloid is the standard cement in all Hollywood studios and cutting rooms as well as the Army and Air Force motion picture service. About a year ago we lost a couple of our largest film exchange customers. Today they are back using Ethyloid as before. We ship to 20 European countries.

R. J. FISHER

President, Fisher Mfg. Co.,
Rochester, N. Y.

PARAMOUNT PICTURES CORPORATION

WEST COAST STUDIOS

5451 MARATHON STREET HOLLYWOOD 38, CALIF.

To the Editor of IP:

. . . Frankly, I have felt all along that the final answer would come in some simple presentation of the motion picture on the screen, one that would be adaptable to all theatres and one in which the cost would not be exorbitant.

We here at Paramount have never felt that stereophonic sound solved the problem in any way, and, of course, have never accepted the principle of stereophonic sound—except we have elected to have one optical sound track on our pictures so that those exhibitors desiring to obtain a stereophonic effect may do so. As you know, they can run the same print with existing standard equipment.

Height of Utmost Importance

We have at all times stated that height was as important to a picture as width. I think your stand has been exactly the same as ours. We agree with you that a picture can be projected successfully on the proper size screen 2-to-1. You, as a projectionist, know that the audience will hardly be able to distinguish between 1.85-to-1 and 2-to-1, especially on a large screen.

It is our feeling that we get a better picture in the VistaVision process when composing it in the ratio of 1.85-to-1. We certainly believe the picture can be well presented and little difference can be noticed when the same print is projected 1.66-to-1.

As I stated in New York, the VistaVision pictures we are making may still be projected on the screen 2-to-1 and maintain all the VistaVision values.

Y. FRANK FREEMAN

Vice-President, Charge of Production

To the Editor of IP:

I assume that many a projectionist lost sleep after reading C. J. Williams' article on page 30 of IP for February, entitled, "Big Future Seen for New Giant Magazine." The large reels were forced upon us as a necessity for projecting 3-D. We took them in our stride and did our utmost to put on the best show we knew how.

Now comes a gentleman who doubtless never struggled with these "hernia givers" tells us that they are practical in use, and decrease the possibility of a bad changeover by 50 percent. He should work on a shift with 55-minute reels for a couple of weeks, and then make this statement. As to better changeovers — what excuse has a man for not making perfect ones every time? That's what he gets paid for!

Not only are tension adjustments more critical with oversize reels, but the least bend in a reel causes uneven pulldown, making it necessary at times to stand and hold the reel so that the film won't be snapped. The heat factor from continuous running is very injurious to projector parts. Things happen that were unheard of with 2,000-foot reels. As an example, we had a lamphouse gear bind up from the built-up heat.

JOHN W. MAUTKE

Local 337, Utica, N. Y.

Re-Opening The Drive-In

This is the second and final installment of this article which details the requisites for the proper refurbishment and subsequent efficient operation of the drive-in theatre, projection-wise.

Lamphouse Optics

14. LAMP OPTICS. Mirrors and condensing lenses must be taken out of the lamphouse for thorough cleaning. The very gentlest handling of these optical elements is the best protection against accidental breakage. Approved cleaning methods for lamphouse optics have already appeared in IP. Damaged and defective mirrors should be replaced without delay.

The projector optical train may now be lined up by any of the usual methods — passing an aligning rod or stretching a string through the optical centers until the generator or rectifier has been checked.

15. GENERATOR OR RECTIFIERS. Check the condition of the ballast rheostats and their connections. When the current-supplying device is a motor-generator set, proceed as follows:

Turn the generator over by hand to note the "feel" of the machine. Carefully blow out all the dust from the interior. Examine the commutator and the brushes for wear and defects. Clean the commutator, scrape away all dirt from the mica spacers between the copper bars, and dress the commutator by applying a *mere trace* of petroleum ("Vaseline") to its surface. Correct improper brush tension.

Grease the generator per manufacturer's instructions. Run-in the generator for 30 minutes before drawing current from it.

If the current-supplying outfit is a rectifier, clean the cabinets and note the condition of the chemical stacks, blower motors, *etc.* In the case of tungar-type rectifiers, test all tubes for plate current and replace the weak ones.

Pre-Show Light Test

All switches not previously examined should now be checked. Familiarize yourself with the switchboards, fuse blocks, *etc.*, and replenish the supply of spare fuses.

16. LIGHT TEST. Burn-in a new trim of carbons in each lamp. Adjust the arc-feed mechanisms to maintain the correct arc gap.

Project blank light to the screen. (Guard against lens injury by running the projectors, if rear-shutter models, and employing only brief flashes of light for the test.) Adjust the reflector for the most uniform screen illumination, and adjust arc-mirror distance to obtain the brightest light. Now adjust the arc-indicator so that the image of the positive crater coincides with the line on the arcoscope card.

Adjustment of mirror-aperture distance may be necessary in some cases, especially when the light output of the projectors is not balanced.

With the lens-holder of each machine loosened and the focusing carriage in midway position, move the lens in or out by hand until a sharp image of the aperture edges is projected on the screen. Then carefully pull the lens out toward the screen until the aperture image is only *very slightly* blurred. Tighten the nuts of the lens-holder with the lens in this position.

If necessary, make pedestal adjustments so that the projected fields of both projectors coincide on the screen. Mentally note desired changes in the placement of the screen masking battens.

Screw, Picture Test

17. SCREEN AND CURTAINS. Make the necessary changes in the screen masking and note the condition of the screen. Dust spots may sometimes be brushed away with a soft brush or clean cloth.

Check grand-drape and title-curtain controls, and ascertain the closing time of the title curtain — information needed for "cueing" films.

Check striplights, footlights, *etc.*, for burned-out bulbs and bulbs of the wrong size or color. Make certain that all projection and observation port glasses are of the best quality and *scrupulously clean.* (See "Emphasis on the Port Side" by A. Buckley, IP for January, 1949, p. 12.)

18. PICTURE TEST. Use a good quality print for test purposes. Before threading up, however, check the timing of the occulting shutter. Bring

The Fair-Haired Boy:

Wide-Angle, Short-Focal Lenses

There is no question but that high-level policy decisions made in the last month point dramatically to a large screen image having not only width but height. We in the projection field know that this type of screen image may be achieved only by the use of a wide-angle, short focal-length projection lens.

Comes now a challenge to American optical designers in the form of a "Super Kiptar" lens made by the world-famous Schneider Optical Co. of Gottingen, Germany. These lenses are in the best tradition of German optical technology. Significant is the fact that these lenses are produced in one-fifth steps from 2.0 up to 3.80 at a speed of F:1.9. A new series of lenses now under development will extend considerably this range of focal lengths. These Super Kiptar lenses constitute an interesting departure from the time-honored Petzval-type lens which has served the projection field so long and efficiently.

The usual aplanatic, or Petzval-type lens gives superior performance only inside a field of view not exceeding 10 of 15 degrees. The Super Kiptar, a double anastigmatic lens, would seem to give a clear field of approximately three times as great, namely, 30 to 45 degrees. This wide field of view which gives a "flat" field is ideally suitable for wide-screen projection.

The chief difference between the Super Kiptar and other widely-used double-anastigmats is that the front internal couplet of the former does not have cemented components — a question which will continue to evoke considerable controversy in projection circles.

The three great families of projection lenses — the Petzval aplanats, the anastigmats, and the double-anastigmats — will provoke as large a variety of opinion as there are projectionists. As always, performance under actual field conditions will provide the answer.

the manual shutter adjustment to the midway point. Free the shutter on its shaft. Place a reference marker over any tooth of the intermittent sprocket when at rest. Turn the mechanism by hand, and when the second tooth from the first comes under the marker, turn the loosened shutter to mid-occultation position. Tighten the shutter screws. (See adjacent boxed comment on shutter blade width.)

Set the framer midway and thread up the reel of film. Project the picture and sharpen focus and framing adjustments. Note carefully any defects which require correction — the adjustment of the lateral guide rollers, for example. (There is no need for sound during this test.)

Sound Reproduction Check

19. SOUND SYSTEM AND SOUND TEST. It is assumed here that the complex tests and adjustments necessary in connection with the sound system will be made by a sound service engineer. The projectionist not having the benefit of sound service ordinarily must rely on the usual circuit- and tube-testing methods. The focus of soundhead optics may be set by the "flicker-test" method. The lenses of the optical tubes must be cleaned from time to time, of course, but care should be taken not to disturb the focus.

A final check-up on the sound may be conducted by running films in both projectors simultaneously and switching the fader back and forth to determine whether the output level of both machines is the same. The closeness of the "match" should be within ½ db. Sound quality, particularly the clearness of the higher tones, should be checked from the auditorium.

The correlation between correct "average" auditorium and projection-room monitor volume levels may now be established.

All is now in readiness for a com-

(Continued on page 30)

Fox Nets Large 1953 Profits

Earnings of $4,560,887 have been reported by 20th Century-Fox for 1953, compared with $2,178,117 in 1952. The company set a record in 1953 in both foreign and domestic film rentals. The total for both was $105,662,000, an increase of 13.4% over the total $93,167,000 for 1952.

Clear Crisp Pictures with

SUPER SNAPLITE PROJECTION LENSES

Your patrons will notice the difference! Super Snaplites give you Sharper Pictures, More Illumination, Greater Contrast and Definition.

For the Best in Projection use Super Snaplites . . . the only Projection Lenses to give you a true speed of f/1.9 in every focal length up to 7 inches.

Ask for Bulletin 212

KOLLMORGEN *Optical* **CORPORATION**

Plant: Northampton, Massachusetts

New York Office: 30 Church St., New York 7, N. Y.

"YOU GET MORE LIGHT WITH SUPER SNAPLITE"

Film Biz Thrives on Confusion — *or Does it?*

"Confusion breeds coin" says the appended excerpt from a recent issue (March 31) of "Variety," the bible of show-business. IP agrees with this statement only to the extent that confusion induces the stimulus for the desperately-needed technological advancement, particularly in terms of industry-wide agreement upon reproduction standards.

APPARENTLY there is nothing like turmoil to bring the motion picture business out of a rut. Often billed as one of the few industries that can afford the luxury of one crisis after another, the film trade is now marking gains on various financial fronts. (1) Profits are better generally than in the last several years. (2) Companies have tightened operations and in many ways achieved a more realistic economy. Official reports from circuits and distributors show that audiences are growing. (4) Achieved tax cuts on admissions represent another plus.

The film colony's fascination with, but uncertainty about, the new "scopes" appears an example of where confusion breeds coin. For all seem agreed that Cinerama, CinemaScope and, in certain instances 3-D, have stirred new public interest in the entire Hollywood output.

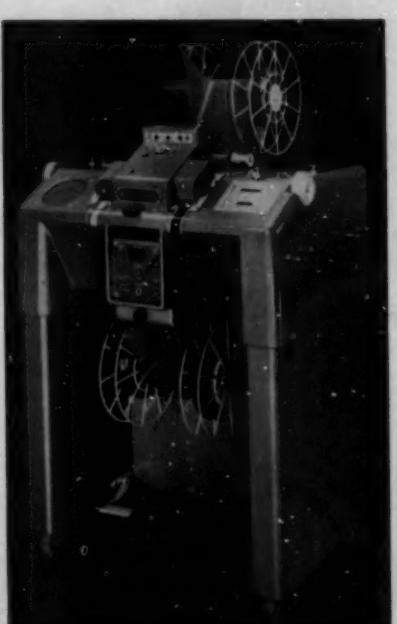
Following is a roundup account of the moneymaking behavior of the principal film and theatre companies:

COLUMBIA—Net earnings jumped to $1,910,000 for the 26 weeks ended last Dec. 26, from $247,000 in the corresponding period a year ago. Studio embarking on a substantially more elaborate production program whose cash requirements likely will rule out possibility of an upped dividend for at least the next six to nine months. Gross business appears rising to $67,000,000 for fiscal 1954, or a gain of over $6,000,000 in comparison with 1953.

LOEW'S—Possibility here of upped divvy within the next six months. Company in June of 1952 cut its distribution to stockholders to 20c quarterly per share, from 37½c. Saving $2,200,000 this year via trimmed pension plan for employees. Earnings for first 1954 quarter went up to 22c per share, compared with 6c in first quarter of 1953. Very strong financial structure. Production inventories now at a low point, influencing decision to step up rate of film-making by eight productions this year.

NATIONAL THEATRES—1953 net was $2,515,000, or 91c a share, compared with $1,877,000, or 68c per share in the previous fiscal year. Attendance dropped 6% and theatre income was off 1% in consequence of NT's divestature of 31 houses, cutting the total to 385. Economies accounted for the earnings upbeat. $1,100,000 shelled out for CinemaScope equipment in 83 situations, and total expenditure figures to climb to $4,000,000 for entire chain. Continued earnings improvement in prospect.

PARAMOUNT—Wall Street estimates place 1953 earnings at $2.90 per share on gross business of $108,000,000. 1952 net was $2.52 per share, gross was $104,800,000. Annual $2 divvy rate has been maintained since company formed in 1950 via divorcement reorganization. Appears definite to continue. Diversified interests include heavy participation in DuMont Labs, Telemeter (coinbox Tv in homes), Chromatic Labs, and ownership of station KTLA in L. A.



Here is a Westrex 35-mm editing machine made available late in 1953, which won a special Academy award for its design, construction and performance. Even prior to this award, this film-editing unit won wide acceptance by all the major Hollywood studios.

RKO PICTURES—Strictly downbeat now, future plans unknown. Howard Hughes offer to buy out entire assets at equivalent of $6 per share still pending. Strongly indicated it will go through (trading price on the N. Y. Stock Exchange has been $5.87½ per share). First nine months of 1953 resulted in deficit of $3,740,000, compared with loss of $4,777,000 in same period of 1952. Some stepped-up production is indicated in tieups with indie film-makers. Hughes, personally, simply unpredictable.

RKO THEATRES—Total income for 1953 up to $34,075,000, from $31,521,000 in previous year. Policy of selling unwanted (meaning unprofitable) properties caused a net loss of $296,600 for the year. Chain took a loss of $1,205,800 on sale of two houses, two real estate properties. Two theatres leased to other interests. Now has 82 theatres, 58 of which have been equipped for CinemaScope. Spent about $1,500,000 on these installations over last year.

STANLEY WARNER—First divvy (20c per share) was paid in January. Earnings for first 1954 quarter hit 21c. No comparisons available but all of 1953 brought loss of 17c per share. Strong upbeat for balance of this year looks for sure. Tieup with Cinerama shaping as important income source. Possible is another cash distribution to stockholders within next nine months.

20TH-FOX—Special divvy of 10c per share declared along with regular 25c payoff for first 1954 quarter. Strong cash position and lessened capital requirements because of fewer productions prompted board action authorizing purchase of 100,000 shares of company's own stock at prevailing prices on N. Y. Stock Exchange beginning April 15. Earnings for 1953 (calendar year) jumped to $4,560,000, or $1.65 per common share, for a gain of over 100%. Has strong competitive edge in C'Scope market, but continued loss of many theatre outlets must be reckoned with if C'Scope licensing conditions are continued.

UNITED ARTISTS—Indie company makes no public disclosures re finances. But reliable sources indicate volume of business more than doubled in last two years. Understood all profits being poured into company fund for financing production, rather than split among limited partnership group. Heavy coin coming from quantity of product (four releases a month) and not alone a few tall money-making pix.

UNITED PARAMOUNT—(American Broadcasting)—Despite the lopping of 39 theatres over the year, operating income of $114,926,000 for 1953 was just

slightly under the previous year. As of start of 1954, chain comprised 669 situations. ABC division showing improvement but still for all of 1953 was a deficit operation. Consolidated net for 1953 amounted to $8,996,000, including $4,480,000 from operations and $4,516,000 from cap gains, equal to $2.14 per common share. No per-share comparison available due to changes in capital structure of circuit as now amalgamated with ABC. Program of C'Scope installations is listed as a $6,000,000 expenditure.

UNIVERSAL—Excess profits tax nicked U for 45c per share last year. With this levy now removed, monetary picture still further brightened. Net of $772,979 for the 13 weeks ended last Jan. 30 was highest quarterly report in eight years. Extra 25c dividend was voted last December along with 50c regular. Another 25c special is looked for in not too distant future. U has been steadily on monetary upbeat for the last five years.

WARNER BROS.—Now appears gaining ground following setbacks stemming from domestic theatre divorcement. For 1954 fiscal year, which ends Aug. 31, profit at $1.60 per share foreseen by some analysts. 1953 net was $1.17 per share, exclusive of capital gains. Divvy rate holding at 30c per quarter.

PERSONAL NOTES

THOMAS W. HOPE has been appointed assistant advisor on non-theatrical film at Eastman Kodak. Hope is well known in the audio-visual field. Since 1945, he has been manager of the film department at General Mills, Inc. In his new post he will assist John Flory, Kodak's advisor on non-theatrical films.

ADOLF R. SCHWARTZ, managing director of Westrex Australia Pty. Ltd. for the last two years, will leave there for Bombay in August to assume a new post as manager for Westrex in India. William E. Kollmyer, presently manager in India, will return to New York early in September. He will be assigned to the post of managing director in Australia after taking his home leave and undergoing a period of special training at headquarters in New York.

ROBERT J. CARRINGTON has been appointed advertising manager of the Altec Lansing Corp. Carrington will make his headquarters in Beverly Hills, Calif., where the Altec Lansing manufacturing plants are located.

GLENN M. PINCKNEY, of Altec Service Corp., was tendered a testimonial signalizing 25 years of service with Erpi and Altec on April 30th. The affair honoring Pinckney was held in the offices of Altec's eastern division, Newark, N. J., where he served for several years as branch manager.

Kodak Film About Lenses

"Quality in Photographic Lenses," a 16-mm Kodachrome motion picture produced by the informational films division of Eastman Kodak Co., received a "Golden Reel" award in the first annual selection of 16-mm "Oscars" by the Film Council of America.

IA OBITUARIES

ABE LANG, 60, member of New York Local 306, died suddenly on May 1. For the past 10 years he worked as a projectionist at Paramount News. In the early days of sound, Lang spent a great deal of time traveling all over the country supervising the installation of sound equipment for ERPI. He was a member of Dirigo Lodge No. 30, F. and A. M. He is survived by his wife, Maude, two brothers and two sisters.

FRED W. NEWCOMB, 71, member of Local 223, Providence, R. I., died last month after a short illness. He joined the Providence Local back in 1901 and for 40 consecutive years served as a delegate to IA conventions. For the past 20 years he was secretary for the Third District, IATSE. Many prominent members of the labor movement attended his funeral. The honorary bearers were James E. Brennan, 1st IA vice-president; Herbert Slater, Philip Sugarman, and Fred Coates, members of Local 223, Providence, and Gerald H. Payne, Local 538, Westerly.

JAMES J. GORMAN, 64, president of Local 110, Chicago, Ill. for the past ten years, died last month. At the time of his death he was chief projectionist at the State Lake Theatre in Chicago. He is survived by his wife, two sons, and a daughter.

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Color 'Sensation' vs Color 'Stimulus'

FOR a proper understanding of the anatomy of color we have to distinguish between the conceptions of "color stimulus" and "color sensation," reports the *Philips Technical Review*, Philips Laboratories, Eindhoven, Holland. A color stimulus is the subject of technical color measurements. It is entirely different from color sensation, which is sometimes indicated merely by the word "color" as applying to the subjective sensation of the observer.

The fact that a given color stimulus may give rise to different color sensations is ascribed to a change in the retina of the eye under the influence of light. This phenomenon is termed "chromatic adaptation" and it greatly affects the impressions we obtain from our surroundings.

'Sensation' and 'Stimulus'

The color sensation we get from an object in our surroundings depends upon the following three groups of causes.

(a) The spectral composition of the light that the colored object throws upon the eye.

(b) The "normal" laws of additive color mixing of the eye, *i.e.*, the laws governing the results of additive mixing of colored light for the normal eye under standardized conditions.

(c) All sorts of incidental circumstances affecting the state of our organs of sight at the moment.

The result of a technical measurement of color is called "color stimulus," which depends only upon the factors *a* and *b* aforementioned.

Factors Affecting Vision

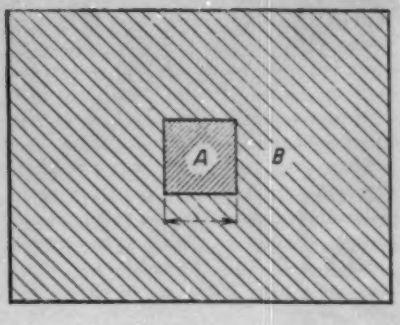
The circumstances affecting the color of a beam of light of given physical properties come under the following headings:

(1) Characteristics of the eye of the individual observer.

(2) Properties of the objects viewed which evoke physical influence, *i. e.*, memory.

(3) The state of the retina, which is affected by other light impinging upon other parts of the retina while the beam from the object is under view, or by such other light as may have just previously reached it.

It might be considered ideal to possess a complete set of specifications for predicting the nature of a color sensation from the various physical conditions. As, however, a color sensation is difficult to express in numerical terms and, moreover, depends upon so many circumstances, some of which are of a non-physical nature, such an ideal can never be fully realized.



The chromatic adaptation of the eye is very well demonstrated by illuminating a transparent window (A) with a light of a certain color and the surrounding field (B) first with artificial daylight, for instance, and then with incandescent light. Shortly after changing over from daylight to lamplight the eye directed upon (A) sees a change of color in the window in the center of the diagram.

Thanks to the simple normal laws of additive color mixing of the eye, it has been possible to draw up complete specifications for the measuring of color stimuli, so that now there are tables enabling one to calculate a color stimulus from the results of purely physical measurements, without any recourse to visual judgment.

Color Sensation Characteristics

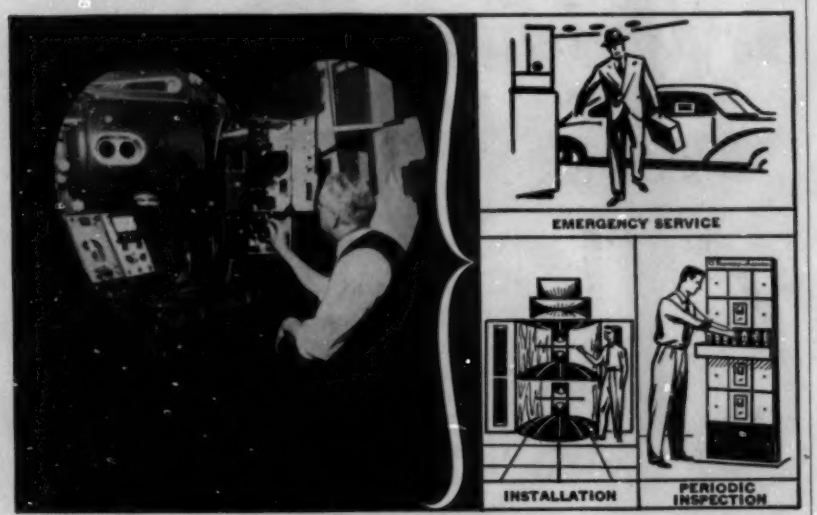
The characteristic features of a color sensation are:

(1) Hue: the property of color sensation causing us to give the color a name such as red, green and blue.

(2) Saturation: the extent to which a color sensation differs from "white" or to which the sensation is "colored"; the property that causes us to speak of faded colors or of vivid colors.

(3) The impression of brightness: the property that causes us to speak of light and dark colors.

The great influence of the surroundings upon colors can be further demonstrated in the following way (Fig. 1). A transparent window can be illuminated



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at the back with a number of differently colored lamps. Around the window is a field which may emit incandescent lamp-light or artificial daylight as desired, without affecting the light passing through the window.

"Persistence of Vision"

If the whole set-up is viewed from a few yards away and the light in the surrounding field is changed from daylight to incandescent lamplight, then in most cases after a while a decided change of color seems to take place in the small lighted window.

The fact that the change in color is not noticed until some time after the surrounding light is changed indicates that the eye requires some time to adapt itself to the changed surroundings.

A "law" has been formulated which for a number of years now has been widely adopted by psychologists and physiologists:

"The color sensations created by the colored objects in our surroundings are practically independent of the kind of light with which the whole scene is illuminated."

Goombye Curved Screens?

Proponents of the curved screen received a near-fatal blow with the opening of the installation by the Radio City Music Hall, N. Y. City, world's largest theatre, of a *Flat Matte* seamless screen. This move by the Hall is public confirmation in a smashing manner of every objection to curved screens ever voiced by IP.

This signal defeat for the adherents of curved screens, which IP regarded from the very first as a "joker," was all the more humiliating because it happened simultaneously with the opening at the Hall of the CinemaScope production "Rose Marie" (M-G-M).

The flat matte screen was also used for the subsequent highly important (to Paramount) demonstrations of VistaVision films before a highly critical audience.

As always, the passing of time inexorably demolishes the fakers and the technically ignorant.

New Advertising Projector

An automatic projection unit designed to be used in theatres for promotion of coming shows, concession products, etc., has been marketed by Genarco, Inc., of New York City. Called the "Sales Robot," the new unit provides a 5-inch by 6-inch rear-projection image for seven seconds and then automatically changes the slide.

Sharpest image, edge-to-edge... most uniform light distribution... on any screen!

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RE-OPENING THE DRIVE-IN

(Continued from page 25)

plete 2- or 3-reel picture-and-sound rehearsal which will provide practice in opening and closing the show and in making changeovers.

20. AUXILIARY APPARATUS. A check of film rewinders, splicers, storage cabinets, stereopticons, spotlights, *etc.*, is in order. The non-synchronous phonograph is also to be examined for mechanical and electrical defects. Frequency response changes may be necessary when disk reproduction is unsatisfactory.

Projection preparations in drive-in theatres are comparatively simple. This type of theatre is a fairly recent innovation, hence the projection equipment installed in such operations is comparatively modern. Sound tests in drive-in theatres include a check of all plug-in boxes and in-car speakers.

Screen problems, too, are different from those in permanent theatres. Evidences of weathering on the screen surface call for a repainting of the entire screen.

The suggested procedure for lining up the equipment in the "permanent" type of theatre is applicable in a general way to drive-in and "temporary" theatres. The projectionist assigned to a summer theatre can make certain of conserving time and effort by taking this copy of IP along with him, or else jotting down in his notebook the numbered capital-letter headings of the 20 steps present herein.

BACKSTAGE AT CINERAMA

(Continued from page 16)

tape clipping along at that rate with very little of it overlapping.

I did not get to see the console unit until several nights later—and then in the company of Jim Day, veteran projectionist and console operator. An audiophile and amateur radio operator with a background in theatre operation and sound work, Jim is particularly well qualified for his job. While waiting for the second half of the show to start, I asked him a few questions about the console. "Come on," he said, "I'll show you."

"Turn up your spotlights, Earl," Jim said into the microphone after we had settled ourselves before the control panel. The great concave curtain suddenly was bathed in radiance.

"Houselights half way." As the electrician backstage dimmed the chandeliers, Jim began reciting a check list for the projectionists:

"One 'B,' Print Eleven. In frame. 'S' in the upper left hand corner. Counter on zero. Gate in top side up. Full trim, clamp down. Sound is in 'remote': Able, Baker, Charlie, switch to 'remote' when you are ready."

One after another, three orange lights appeared on the control panel, indicating that the projectionists had turned over control of their machines to the console.

"Open the curtain," said Jim; and the huge drapes rolled apart, revealing the magenta-lighted screen. "Motor count: one, two, three, *on*." He pushed several switches to the right and Lowell Thomas' voice began shouting "quiet" from various parts of the auditorium — the beginning of the stereophonic sound demonstration.

"All machines are now in sync," Jim announced.

"In sync with what?" I asked. "There's no picture."

"No, but all machines are running," he replied, indicating three flashing green lights on the board. "There are 461 feet of opaque leader before the Cypress Gardens sequence begins."

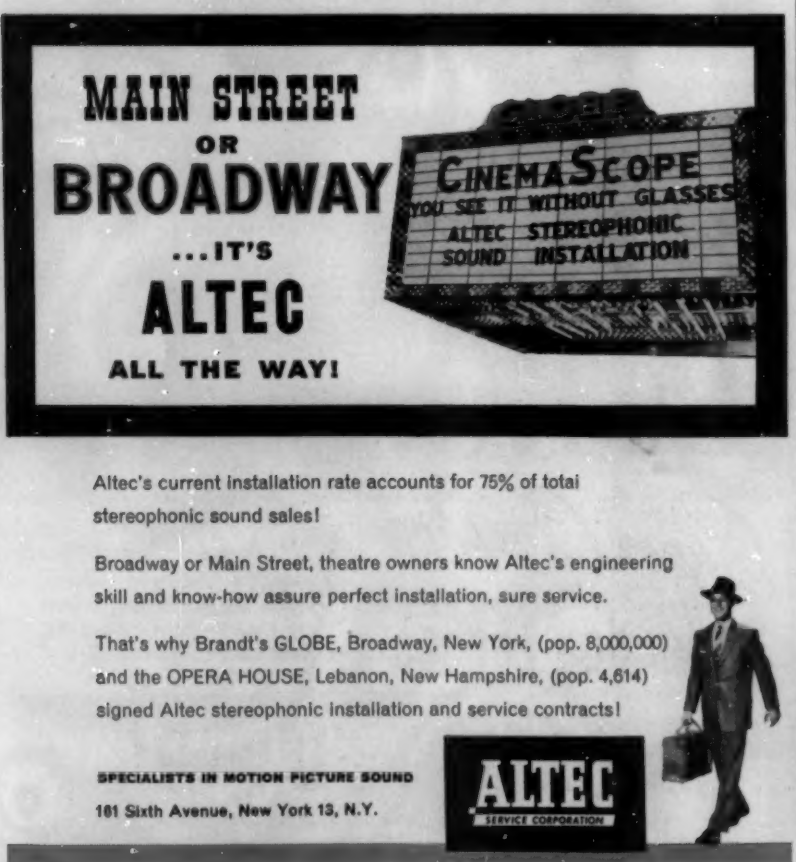
Starting the Picture

Just as the sound demonstration ended, Jim flipped three switches, opening the dousers on the projectors. Simultaneously, he told Earl to kill the screen lights. Suddenly we were in Florida, enveloped by the Cypress Gardens.

"How do you correct the sync from here?" I wanted to know.

"Here," motioned Jim, "I'll show you. The center projector is behind right now."

Sure enough, the center green light was failing to flash, though I could not detect anything amiss on the screen. Holding down a switch to



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override the automatic synchronizer, he began turning the center one of three knobs on the board. When he had turned it to the right two graduations, the center light began to blink again.

"Two frames out," he said. I went on asking questions.

"How do you get the projectionists to regulate their arcs in order to match the brilliance of the screen panels?"

"I don't. I control them from here —watch the right panel." As he held down a switch, a slight change in light intensity could be noticed on one of the panels. Reversing the switch brightened it again.

Jim explained as the canoeing sequence began to unfold, "each of the five channels runs through its own speaker behind the screen. But we have an additional effect that sounds even better." He plugged a patching cord into the console board.

The effect was as if the Everglades suddenly were all around us. What he had done was to put the bird calls which had been coming down from one of the stage speakers onto the auditorium speakers as well. Later on, during the America sequence, he arranged the choir so that the basses sang from the rear, the sopranos from one side, and the altos from the other. The effect was terrific.

The side and rear speakers are always manually controlled. Since the stage speakers account for five of the sound tracks, the operator must manually direct the sixth track wherever it belongs in the auditorium. The seventh, or composite track, is not used regularly. Playing the same track out of all the speakers at once results in sound wave interferences that cancel each other out in some parts of the auditorium, reinforce each other and distort the sound in others.

New Productions

I asked Ed Miller what plans there were for new Cinerama productions. "Louis de Rochemont (who made *Martin Luther* and *House on 92nd Street*) is working on one for us," he said. "He had a crew in New England that finished up there recently and then went to Europe; and another crew just got back from South America. It will obviously be some kind of travel picture, but I don't know any of the details."

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WHO KILLED COCK ROBIN?

(Continued from page 10)

the demands of precision and technology to the death.

How valiant was his resistance may be judged from a 3-D trade premiere in a three-quarter-million community where the projectionists were denied any rehearsal and the preparation and alignment of equipment was cut short with the exhibitorial comment that "it wasn't necessary". Consequently the picture opened with:

1. Projectors out of plumb and out of registry.
2. Projectors out of synchronism.
3. One projector 1½ turns out of focus.
4. Polaroid filter on the other projector reversed.

A film company representative viewing the premiere stated it was the best of 14 he had seen. The other 13 must have been beauts.

Another theatre in the same city ran a 3-D picture out of synchronism for its entire engagement. The manager refused to let it be corrected. Such was the calibre of the exhibs valiant resistance. Their heroism is fittingly memorialized in the mute fronts of their dark and silent theatres.

Here and there are faintly flickering promises that sufficient exhibitors have realized that this is IT, that the dictum now is precision and technology "or else" if the industry is to stay alive. It is less likely that the engineering and service companies one day will realize that one smooth performance in the laboratory and a *full day* of smooth *performances* in the theatre are two vastly different matters and that the latter absolutely requires advance delivery of film and tape, inspection, constant checking, adequate pre-show cleaning and adjustment and rehearsals

All these add up to "booth costs." If the exhibitor be unwilling to pay this nominal price for a full house, he should then emulate the farmer and the airlines, set up a good lobby in Washington and get a government subsidy. After all, you can't beat "free enterprise" — if someone else will pay for it.

ANATOMY OF C'SCOPE

(Continued from page 8)

lowed by 20th to employ such a screen for CinemaScope, the production of CinemaScope films by other companies and the waning novelty-value of the process will undoubtedly spur efforts toward pictorial improvement by means of a flat screen.

Flat Matte Screen advocated

But it is not only to obtain a flat surface for undistorted CinemaScope projection that the writer advocates matte screens. Aluminum screens have several serious faults which must be weighed against their two advantages —high brilliance and ability to preserve the polarization of light in 3-D projection.

Aluminum screens, even in standard projection, are likely to impart a grainy, blotchy appearance to the projected pictures. The graininess, usually visible from seats near the screen, is caused by the physical characteristics of aluminum pigments and by the texture of the screen fabric to which the metallic paint is applied. One of the approved CinemaScope

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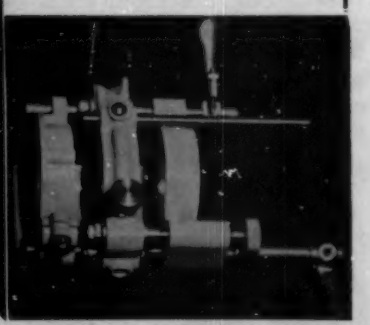

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screens, for example, is embossed in such a way that the pictures look as though they had been photographed on coarse-grained film. The blotchiness is due to wrinkles and "waves" in the screen.

Wrinkles in matte screens are invisible if not too severe, and they never produce irregularities in lighting. Aluminum screens, on the other hand, are so specular or mirror-like that the slightest departure from a smooth surface shows up as dark spots or streaks. Even the most careful stretching is no guarantee that the curved aluminum screen will have the smoothness necessary for uniform brightness when illuminated by the virtual point-source of the projector lens.

These two failings of aluminum screens result in a noticeable deterioration of pictorial quality. Fine detail of low contrast is partially obscured by the graininess of the CinemaScope screen, and the delicate nuances of photographic tone, so perfectly reproduced on matte screens, are coarsened and blurred on aluminum screens. The loss of definition is practically invisible from the back rows of seats; but the blotchiness of illumination is not masked by distance.

Deterioration of Image Character

In wide theatres the use of aluminum screens is inacceptable because of the extremely serious fadeaway of light at large viewing angles. While patrons in the middle of the auditorium see an excessively bright picture, observers seated at the sides of the auditorium see a dim picture. As seen from the side seats "down front," the picture is eye-strainingly dark. Differences in brightness at different viewing angles do not exist with matte screens.

Recall the aforementioned effect of perspective-foreshortening with curved screens. While the foreshortening experienced by an observer seated at the side of the auditorium is uniform in degree in the case of flat screens, the curved screen gives a greater amount of foreshortening on the side nearest the observer. But more annoying than the non-uniform foreshortening with curved screens is the serious fadeaway of light on the side of the aluminum screen farthest from an observer in a sideseat. Only close to the center-line of the auditorium does the picture-illumination appear reasonably uniform on the curved, aluminum-surfaced CinemaScope screen.

Seamless Screens a "Must"

The specular characteristics which make wrinkles in aluminum screens highly visible also makes seams disagreeably conspicuous. CinemaScope screens should be made in one piece, or else joined so that no seam is visible. The large number of conspicuous seams in the Miracle Mirror screen, for example, produce the effect of vertical wires suspended between the observer and the crazily-distorted world of CinemaScope. Yet Miracle Mirror is an *approved* screen! The miracle, we think, is that 20th-Fox would approve decorating "The Robe," its most grandly upholstered CinemaScoper, with barrier-like vertical seams that resemble the bars of a bird-cage.

The "depth-effect" of CinemaScope isn't even an illusion—it's totally nonexistent. The myth is kept alive by the pitchman's slogan, "You see it without glasses." The implications are fraudulent. One look at CinemaScope with or without glasses is sufficient to demonstrate the strictly 2-D quality of the process.

Image Composition Governs

The illusion of depth is greater in a conventional picture than in CinemaScope because the exaggerated wideness of the latter, together with the geometrical distortions resulting from screen curvature and projection angle, materially decrease the psycho-visual effectiveness of photographic perspective. As a substitute for real stereopsis, CinemaScope is a big disappointment. It has no more depth than an animated billboard.

Anent CinemaScope, our opinion is that landscapes from which *straight*

Movie Critique

"Prince Valiant" and "Rose Marie" — they are big, booming, CinemaScopic broadsides that make loud noises and blast thin air.—*Bosley Crowther, N. Y. Times.*

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lines are absent—scenes of mountainous terrain, for example,—are thrillingly realistic on the wide screen. This is especially true when such scenes are shot from airplanes or vehicles to impart motion to the camera.

The illusion is, however, one of spaciousness and distance, not of true 3-D. Stereoscopy, or 3-D, involves *binocular* perception of depth, which obtains only in the case of nearby objects. Scenery more than 900 or 1000 feet distant is absolutely "flat" as perceived by human vision; and true stereoscopy appears only when foreground objects are present.

Conventional 3 x 4-proportioned 2-D movies are similarly capable of effectively reproducing the grandeur of natural scenery *when the screen is suitably* large (as it is in many theatres) and they have the advantage over CinemaScope of superior photography, undistorted pictorial representation, and a better suggestion of depth. True 3-D movies, *which must be viewed through analyzers,* are useful as a novelty and should be continued on that basis.

So, too, should CinemaScope, for that matter. But like CinemaScope, 3-D pictures fall far short of the standards of viewing comfort and naturalness which have characterized conventional pictures for many years.

Presently, CinemaScope employs a specially performed 35-mm film to which is applied three magnetic sound strips 0.063 inch wide and one which is only 0.029 inch wide. (The narrow strip, intended for incidental sound effects, is seldom used.) Of the three comparatively wide strips, one is adjacent to the picture-area and occupies the place of the somewhat wider normal photographic soundtrack of standard release prints. The other two are placed outside the perforations.

Magnetic-Track Structure, Cost

These strips, applied to the base-side of the film, contain finely divided iron oxide obtained by chemical precipitation and constitute magnetic soundtracks for stereophonic reproduction. This, together with several other factors to be discussed, makes CinemaScope prints much more expensive than standard release prints.

The CinemaScope projector-aperture (0.912 x 0.715 inch) is approximately 9.5% wider and 16.1% higher than the standard 35-mm aperture. The standard soundfilm aperture accordingly has an aspect-ratio of 1 to 1.375 (which is exactly reproduced on the screen by normal projection lenses at a zero-degree projection angle), while the CinemaScope aperture has an aspect-ratio of only 1 to 1.275. But because the anamorphic CinemaScope lens has an "extension-factor" of 2, the *projected* CinemaScope picture has an aspect-ratio of 1 (1.275 x 2) which equals 1 to 2.55. Fig. 3 illustrates the relative sizes of standard and CinemaScope projector apertures and screen images.

The slightly larger size of the CinemaScope aperture does not require an increase of arc current. This aperture merely utilizes more of the "spot" and passes about 1.3 times more light to the lens. The anamorphic lens, however, cuts screen illumination (foot-candles) in half because it doubles the area of the picture. If a white screen were used, twice the normal amount of light would be needed for CinemaScope; on an aluminum screen having twice the apparent brightness of a white screen (foot-lamberts), no increase in arc amperage is necessary.

Inherent Error Magnified

Very important in CinemaScope projection is the fact that the anamorphic lens having an extension-factor of two (2) doubles the amount of sidesway of the picture. The writer has observed that the sidewise weaving is especially disagreeable with projectors having studio guide-rails for edge-guiding the film through the gate. The rails seldom fit the width of the film exactly; and if adjusted to accommodate brand-new prints, they will be too far apart to prevent sideway when shrunken film is run. *All film, even triacetate safety stock, shrinks with age and repeated use.*

Sidesway occurs in the older projectors having but one flanged guide-roller and no guide-rails, of course; but the absence of guide-rails makes weaving less conspicuous. When the film "brings up" against one guide-rail, it immediately "bounces" to the other rail and oscillates from side to side in an irregular manner. The rails *limit the range* of sidesway, but they *increase its frequency,* making it very objectionable indeed.

The sidesway problem has been *completely* licked in projectors employing *two* flanged guide-rollers, one at the top of the gate and the other just below the intermittent sprocket. Projectionists who do not have machines of this modern construction will find that a pair of older mechanisms having no guide-rails will give excellent CinemaScope results if the mechanisms can accommodate f:1.9 lenses and are fully reconditioned.

[TO BE CONCLUDED]

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